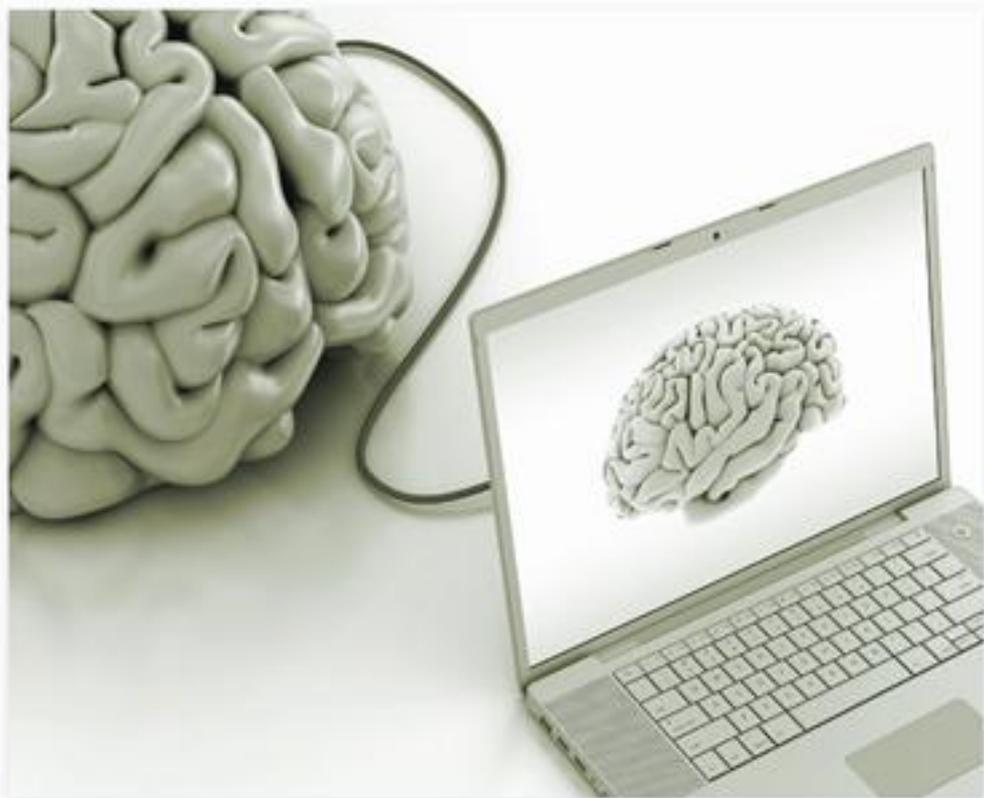


PREMIER REFERENCE SOURCE

Social Knowledge

Using Social Media to Know What You Know



John P. Girard & JoAnn L. Girard

Social Knowledge: Using Social Media to Know What You Know

John P. Girard
Minot State University, USA

JoAnn L. Girard
Sagology, USA



INFORMATION SCIENCE REFERENCE

Hershey • New York

Senior Editorial Director: Kristin Klinger
Director of Book Publications: Julia Mosemann
Editorial Director: Lindsay Johnston
Acquisitions Editor: Erika Carter
Development Editor: Julia Mosemann
Typesetters: Natalie Pronio & Keith Glazewski
Production Coordinator: Jamie Snavely
Cover Design: Nick Newcomer

Published in the United States of America by
Information Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue
Hershey PA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: <http://www.igi-global.com>

Copyright © 2011 by IGI Global. All rights reserved. No part of this publication may be reproduced, stored or distributed in any form or by any means, electronic or mechanical, including photocopying, without written permission from the publisher. Product or company names used in this set are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark.

Library of Congress Cataloging-in-Publication Data

Social knowledge : using social media to know what you know / John P. Girard and JoAnn L. Girard, editors.

p. cm.

Includes bibliographical references and index.

Summary: "This book provides relevant theoretical frameworks, latest empirical research findings, and practitioners' best practices social knowledge, for improving understanding of the strategic role of social knowledge in business, government, or non-profit sectors"--Provided by publisher.

ISBN 978-1-60960-203-1 (hardcover) -- ISBN 978-1-60960-205-5 (ebook) 1.

Organizational learning. 2. Social networks. 3. Knowledge management. I.

Girard, John P., 1961- II. Girard, JoAnn L.

HD58.82.S63 2011

658.4'038--dc22

2011000065

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

Editorial Advisory Board

Alex Bennet, *Mountain Quest Institute, USA*
Nick Bowersox, *TUI University, USA*
Kimiz Dalkir, *McGill University, Canada*
Cindy Gordon, *Helix Commerce International, Canada*
Parissa Haghirian, *Sophia University, Japan*
Haris Papoutsakis, *Technological Education Institute (TEI) of Crete, Greece*
Suzanne Roff-Wexler, *Compass Point Consulting, USA*
Michael Sutton, *Westminster College, USA*
Jerry Westfall, *Liberty University, USA*

List of Reviewers

Alex Bennet, *Mountain Quest Institute, USA*
David Bennet, *Mountain Quest Institute, USA*
Nick Bowersox, *TUI University, USA*
Kimiz Dalkir, *School of Information Studies, McGill University, Canada*
Loretta L. Donovan, *Innovation Partners International, USA*
John Girard, *Minot State University, USA*
JoAnn Girard, *Sagology, USA*
Cindy Gordon, *Helix Commerce International Inc., Canada*
Parissa Haghirian, *Sophia University, Japan*
Benjamin Hentschel, *Sophia University, Japan*
Phuong Thao Le, *Diploma Business Informatics, Germany*
Rita Yi Man Li, *The University of Hong Kong, Hong Kong*
Chethan M, *Triumph India Software Services Pvt Ltd., India*
Scott Campbell Mackintosh, *Glengarry Group Consulting, Canada*
Marcelo Machado, *Kwantlen Polytechnic University*
Stefania Mariano, *New York Institute of Technology, Manama, Kingdom of Bahrain*
Paul J. McBride, *PhD Student, USA*
Andrew Miller, *Andrew-Miller.com, USA*
Nhu T. B Nguyen, *Japan Advanced Institute of Science and Technology, Japan*

Haris Papoutsakis, *Technological Education Institute of Crete, Greece*
Maruthi Prasad, *Triumph India Software Services Pvt Ltd, India*
Sun Wah Poon, *The University of Hong Kong, Hong Kong*
Mohan Ramanathan, *Triumph India Software Services Pvt Ltd, India*
Salvatore Rasa, *im21 (innovation/measurement 21st. century), USA*
Suzanne Roff-Wexler, *Compass Point Consulting, USA*
Prof.dr.sc. Fjodor Ruzic, *Institute for Informatics, Croatia*
Michael Sutton , *Westminster College, USA*
Vivek K Thakur, *Triumph India Software Services Pvt Ltd, India*
Katsuhiko Umemoto, *Japan Advanced Institute of Science and Technology, Japan*
Jagdish K Vasishtha, *CoFounder and CEO Injoos, India*
Jerry Westfall, *Liberty University, USA*

Table of Contents

Foreword	xv
Preface	xix
Acknowledgment	xxiv

Section 1 Social Knowledge in Action

Chapter 1

Social Learning from the Inside Out: The Creation and Sharing of Knowledge from the Mind/Brain Perspective.....	1
<i>David Bennet, Mountain Quest Institute, USA</i>	
<i>Alex Bennet, Mountain Quest Institute, USA</i>	

Chapter 2

Measuring the Impact of Social Media: Connection, Communication and Collaboration.....	24
<i>Kimiz Dalkir, McGill University, Canada</i>	

Chapter 3

Challenging our Assumptions: Making Sense of the Sharing of Social Knowledge.....	37
<i>Suzanne Roff-Wexler, Compass Point Consulting, USA</i>	
<i>Loretta L. Donovan, Innovation Partners International, USA</i>	
<i>Salvatore Rasa, im21 (innovation/measurement 21st. century), USA</i>	

Chapter 4

Social Knowledge Case Study: Innovation Linked to the Collaborative Socialization of Knowledge.....	61
<i>Cindy Gordon, Helix Commerce International Inc., Canada</i>	

Chapter 5	
Social Knowledge in the Japanese Firm	78
<i>Benjamin Hentschel, Sophia University, Japan</i>	
<i>Parissa Haghirian, Sophia University, Japan</i>	

Section 2
Cultural Aspects of Social Knowledge

Chapter 6	
Cultural Barriers to Organizational Social Media Adoption.....	96
<i>Andrew Miller, Andrew-Miller.com, USA</i>	

Chapter 7	
Organizational Culture: A Pillar for Knowledge Management.....	115
<i>Paul J. McBride, PhD Student, USA</i>	

Chapter 8	
Social Leadership: Exploring Social Media and the Military – A New Leadership Tool.....	129
<i>Scott Campbell Mackintosh, Glengarry Group Consulting, Canada</i>	

Chapter 9	
Foundations of Cross-Cultural Knowledge Management.....	139
<i>Nhu T. B Nguyen, Japan Advanced Institute of Science and Technology, Japan</i>	
<i>Katsuhiro Umemoto, Japan Advanced Institute of Science and Technology, Japan</i>	

Section 3
Social Knowledge Tools, Techniques and Technologies

Chapter 10	
Becoming a Blogger: A Social Knowledge Experiment.....	164
<i>Stefania Mariano, New York Institute of Technology, Manama, Kingdom of Bahrain</i>	

Chapter 11	
Encouraging Participation in Virtual Communities of Practice within the United States Air Force.....	179
<i>Nick Bowersox, TUI University, USA</i>	

Chapter 12	
Social Knowledge Workspace.....	193
<i>Jagdish K Vasishtha, CoFounder and CEO Injoos, India</i>	

Chapter 13

Sharing Scientific and Social Knowledge in a Performance Oriented Industry:
An Evaluation Model 207
Haris Papoutsakis, Technological Education Institute of Crete, Greece

Chapter 14

Social Knowledge: The Technology Behind..... 236
M. Chethan, Triumph India Software Services Pvt Ltd., India
Mohan Ramanathan, Triumph India Software Services Pvt Ltd, India

Chapter 15

Empowering Social Knowledge with Information Technology: Technological
and Cultural Issues Convergence 249
Fjodor Ruzic, Institute for Informatics, Croatia

Compilation of References 292

About the Contributors 320

Index 326

Detailed Table of Contents

Foreword	xv
Preface	xix
Acknowledgment	xxiv

Section 1 **Social Knowledge in Action**

Chapter 1

Social Learning from the Inside Out: The Creation and Sharing of Knowledge from the Mind/Brain Perspective.....	1
--	---

David Bennet, Mountain Quest Institute, USA

Alex Bennet, Mountain Quest Institute, USA

This chapter explores from the viewpoint of the mind/brain the factors and conditions which influence the social creation and sharing of knowledge. A foundation is developed by providing clear definitions of information, knowledge and learning, including levels of knowledge and the process through which the mind/brain creates new knowledge. Then neuroscience findings are used to discuss social interaction, including environmental impacts on the creations and sharing of knowledge. Factors such as arousal and stress level, social attunement, holding environment, intersubjective space, level of trust, social bonding, and an enriched external environment are posited to enhance the creation and sharing of knowledge. Finally, the individual learning and knowledge activity is extrapolated to the societal level through a short introduction to collaborative entanglement (learning to create and apply knowledge as communities), and the use of metaphor and story. Summary highlight of neuroscience findings are also provided.

Chapter 2

Measuring the Impact of Social Media: Connection, Communication and Collaboration.....	24
--	----

Kimiz Dalkir, McGill University, Canada

This chapter focuses on a method, social network analysis (SNA) that can be used to assess the quantity and quality of connection, communication and collaboration mediated by social tools in an organiza-

tion. An organization, in the Canadian public sector, is used as a real-life case study to illustrate how SNA can be used in a pre-test/post-test evaluation design to conduct a comparative assessment of methods that can be used before, during and after the implementation of organizational change in work processes. The same evaluation method can be used to assess the impact of introducing new social media such as wikis, expertise locator systems, blogs, Twitter and so on. In other words, while traditional pre-test/post-test designs can be easily applied to social media, the social media tools themselves can be added to the assessment toolkit. Social network analysis in particular is a good candidate to analyze the connections between people and content as well as people with other people.

Chapter 3

Challenging our Assumptions: Making Sense of the Sharing of Social Knowledge..... 37

Suzanne Roff-Wexler, Compass Point Consulting, USA

Loretta L. Donovan, Innovation Partners International, USA

Salvatore Rasa, im21 (innovation/measurement 21st. century), USA

This chapter explores the assumptions we make, the questions we ask, and the “social knowledge” we use to make decisions about our personal and business lives. It poses provocative questions challenging assumptions about using social media to know what we know. The three co-authors take the position of transparency to engage in a dialogue around issues that they agree are critical to any thoughtful exploration of social media: trust, assumptions, and reality. Personal experiences and anecdotes provide context for scholarly ideas and references. The chapter offers its readers a method to continue the dialogue.

Chapter 4

Social Knowledge Case Study: Innovation Linked to the Collaborative Socialization
of Knowledge..... 61

Cindy Gordon, Helix Commerce International Inc., Canada

The premise of this chapter is that Innovation Growth is tightly tied to the collaborative process of socializing knowledge. Case examples from leading companies leading the way in socializing knowledge leading practices will be profiled. These companies will be a mix of new stories from a mix of both profit and not for profit organizations, in a mix of industries. The leaders of these organizations recognize that the socialization process of knowledge is core key to innovation growth. This chapter tells the story of change agents that are helping to move from vision to execution successfully. You will hear of experiences where the full enablement of their programs are not fully funded, or necessarily aligned across all levels of management where the generational gaps between understanding community and value network networks vs those based on linear “one way flow” models continue to conflict with one another; The case studies all started off with a small project well scoped and defined, and organically evolved vs a big bang approach. Each of these cases is rooted in a clear business need either for employee engagement or customer engagement needs.

Chapter 5

Social Knowledge in the Japanese Firm 78

Benjamin Hentschel, Sophia University, Japan

Parissa Haghirian, Sophia University, Japan

It is widely accepted that the Japanese conception of organizational knowledge differs from the Western view, with the former focusing on tacit knowledge and the latter more on explicit knowledge. The distinctive advantage of Japanese companies is widely believed, therefore, to be their unique ability to continuously create new knowledge by means of the dynamic interaction of individuals. Some aspects of Japanese culture are particularly influential on this knowledge management style, such as the strength of face-to-face communication and the emphasis on gestures, behavior and context. These are cultural factors that have shaped Japan's distinctive organizational communication structures in periods of high economic growth. However, having survived the "lost decade," Japan's companies now face a completely new business environment. As new technologies enable new modes of communication between a company's employees, the use of social media in order to facilitate knowledge-sharing (social knowledge) has become widespread. Based on a qualitative study conducted in a Japanese organization, this chapter investigates the extent to which social knowledge influences communicative behavior, and looks at the implications for organizational communication patterns in Japan. The findings of this study point towards changing patterns of social knowledge in Japanese firms.

Section 2

Cultural Aspects of Social Knowledge

Chapter 6

Cultural Barriers to Organizational Social Media Adoption..... 96

Andrew Miller, Andrew-Miller.com, USA

From telephones to fax machines to personal computers to email, most communication technology has been introduced with a business function in mind, prior to becoming a part of our social lives. However, social media is a technological anomaly; private individuals quickly adopted this technology as an extension of their personal life without any previous introduction to it through their workplace. Due to this reversal, many organizations are struggling to understand how this technology can benefit their mission, while many more worry that it will devastate productivity and security. Individuals who wield the power of expansive social media networks can significantly alter an organization's credibility and fiscal health. Organizations who harness the massive data warehouses behind these social media networks have the ability to significantly alter individual lives and society at large; for better or worse. With this backdrop, what cultural barriers are being raised against social media adoption and how can management re-align their understanding of social media to better utilize resources and take advantage of the opportunities this technology presents?

Chapter 7

Organizational Culture: A Pillar for Knowledge Management..... 115

Paul J. McBride, PhD Student, USA

This chapter describes how and why organizational culture is paramount towards endeavors of social knowledge and knowledge management systems. Previous literature is discussed and ideas presented to give an underlying understanding of organizational culture and knowledge management and how the

two interact. It is argued that a culture based on honesty, trust, and openness is best suited for knowledge management. Cultures will ebb and flow as they evolve; thus it is imperative that managers take notice.. Organizations that employ social media to aid in culture development will build systems of knowledge management that are based on proper culture that will inevitably lead to competitive advantage.

Chapter 8

Social Leadership: Exploring Social Media and the Military – A New Leadership Tool..... 129
Scott Campbell Mackintosh, Glengarry Group Consulting, Canada

This chapter will identify the military’s approach to social media and outline the security controversy it views as an inherent issue associated with condoning and promoting the use of social media. It will then discuss how that approach is evolving with the passage of time and the rapid adoption of social media by society as a whole; examining the balance between security concerns and obvious organizational benefits. In discussing social media as a vehicle of transformational leadership this chapter will reveal untapped benefits of social media in a military context and examine where and how it could be adopted. In closing this chapter will make recommendations, which would facilitate a better adoption of various forms of social media by the military.

Chapter 9

Foundations of Cross-Cultural Knowledge Management..... 139
Nhu T. B Nguyen, Japan Advanced Institute of Science and Technology, Japan
Katsuhiro Umemoto, Japan Advanced Institute of Science and Technology, Japan

Although the term “Cross-Cultural Knowledge Management” (CCKM) appeared in the recent literature, no study has defined CCKM yet. This is the first study that discusses the process of cross-cultural knowledge creation. Reviewing the literature on the relationship between cross-cultural management (CCM) and knowledge management (KM), we found that the term CCKM is emerged from two streams. The first stream used CCKM to describe KM in a cross-cultural environment while the second stream explored culture as knowledge. Following two streams, we then define CCKM as a series of practices to recognize and understand cultural differences to develop a new culture thereby adjusting to cross-cultural environment. This definition helped us to examine the process of cross-cultural knowledge creation and the role of leadership in this process. Not only contributing to developing KM in a new way that can be applied to practice in utilizing and creating cross-cultural knowledge for KM activities, but this chapter also may have many practical implications for leaders to manage effectively cross-cultural knowledge of members in organizations.

Section 3

Social Knowledge Tools, Techniques and Technologies

Chapter 10

Becoming a Blogger: A Social Knowledge Experiment..... 164
Stefania Mariano, New York Institute of Technology, Manama, Kingdom of Bahrain

This chapter contributes to social knowledge theory and provides a practical approach for managing social media. This study investigates how knowledge is created, transferred, and shared in social media and proposes a way to manage social knowledge. Qualitative research methods are applied to collect data through in-depth individual semi-structured interviews, think-aloud protocols, focus groups, and document analysis. Data analysis is pursued with the use of the qualitative software package Atlas.ti®. This study contributes to understanding how a community of people creates, transfers, and shares knowledge in a virtual social environment, i.e. a Web log. Findings revealed that knowledge transfer was the primary knowledge process in the management of the Web log and highlighted common issues, concerns, and suggestions on how to develop a more effective virtual social environment. Limitations in the creation, transfer, and sharing of knowledge are discussed, and recommendations on how to improve a Web log are provided for practice.

Chapter 11

Encouraging Participation in Virtual Communities of Practice within the United States Air Force.....	179
<i>Nick Bowersox, TUI University, USA</i>	

With the growth of information and communication technology (ICT) such as the internet, email, and video conferencing, the United States Air Force has become more efficient and productive in conducting its daily business. However, not only do computer technologies increase daily productivity rates among the employees; they also increase the Air Force’s capability to digest larger amounts of information while supporting an end goal of being able to share that information across the entire organization. Perhaps one of the most popular methods by which to share such large amounts of organizational information is through informal learning environments such as communities of practice. The Air Force has no doubt embraced the concept of communities of practice. However, as popular as these “communities” are among many employees, there is still a majority of Air Force employees who choose not to use them. The purpose of this chapter is to provide practical ways in which the United States Air Force can increase participation in Virtual Communities of Practice (VCoPs) among its workforce, as well as providing theoretical frameworks upon which further research can be conducted. Finally, this chapter will propose a set of testable propositions that may serve as the basis for future research.

Chapter 12

Social Knowledge Workspace.....	193
<i>Jagdish K Vasishtha, CoFounder and CEO Injoos, India</i>	

Over the years, knowledge management in organizations has picked up steam with implementation of various solutions like Content Management Systems, Wiki, etc. However, the ability to find relevant information and capture organizational learning still looks like a distant dream. Also, organizations worldwide are transforming due to changes in worker demographics, globalization of business and technological advances. The knowledge workers of today need tools for effective knowledge capture and team collaboration. Some of the key concerns which will be analyzed in this chapter are; (a) Knowledge fragmentation due to technology, (b) Relevancy of information to a user and (c) Push vs. Pull approach of accessing information. The chapter will also explore how these challenges can be addressed by social knowledge workspaces and what should be some of the key characteristics of these technologies under development.

Chapter 13

Sharing Scientific and Social Knowledge in a Performance Oriented Industry: An Evaluation Model.....	207
<i>Haris Papoutsakis, Technological Education Institute of Crete, Greece</i>	

The chapter evaluates the contribution of shared knowledge and information technology to manufacturing performance. For this purpose, a theoretical model was built and tested in praxis through a research study among manufacturing, quality and R&D groups. The social character of science is perceived as a matter of the aggregation of individuals, not their interactions, and social knowledge as simply the additive outcome of mostly scientists, members of the three groups, making sound scientific judgments. The study results verify the significant contribution of shared knowledge to the manufacturing group performance. They also demonstrate that information technology influences notably the manufacturing group performance and, in a less significant way, the sharing of knowledge. Study results are useful to researchers and the business community alike as they may be used as a springboard for further empirical studies and can help put together strategies involving knowledge management and information technology.

Chapter 14

Social Knowledge: The Technology Behind.....	236
<i>M. Chethan, Triumph India Software Services Pvt Ltd., India</i>	
<i>Mohan Ramanathan, Triumph India Software Services Pvt Ltd, India</i>	

Every now and then a technology appears that changes or speeds up the development of civilization in a new direction. It started with agriculture, spread through the Industrial Revolution and to the electronic age and now moved on to a state of technology that people would have laughed at a few decades ago. Social networks have changed the way people connect, redefining the knowledge value system that is being shared without borders or limits. The multitude of science and technology that go behind building the social networks spans across mathematics to engineering to software and ultimately to the realms of psychology and sociology once thought as distantly removed from any application of technology. In this write up, we explore the convergence of many ideas and innovations and the technology that is building these networks.

Chapter 15

Empowering Social Knowledge with Information Technology: Technological and Cultural Issues Convergence.....	249
<i>Fjodor Ruzic, Institute for Informatics, Croatia</i>	

Social knowledge is not a new category; however, in these times of information-communications systems maturity, it becomes an extremely important and valuable asset. In the context of social knowledge, information technology should be constantly harmonized with cultural milieu characterized mostly by invisible culture and its actions. The aim is to make the real and acceptable convergence of cultural and technological issues. Since the knowledge becomes social only with the communication process, it is deeply connected with the terms of media. Social knowledge is alike any media activity where two-tier

principles is included consisting cultural (politics and social paradigm) and technological (information tools) issues. The real drawbacks of social knowledge based on information-communications systems that means the dependency on information technology, is about the continuity - the entire social knowledge base could be fragmented or even lost for future generations. The information/digital content keeping technologies are developed well, but the knowledge and invisible culture assets are under the special treatment if we want to make our social knowledge as the legacy for future generations.

Compilation of References	292
About the Contributors	320
Index	326

Foreword

MESSY COHERENCE

Unlike many of the management movements of the last half century knowledge management has no single origin or unambiguous instantiation. Business Process Reengineering, the Balanced Score Card and the Learning Organisation (to mention but a few) all originate with a single book which then defines the field. In Knowledge Management *The Knowledge Creating Company* has considerable status but it is only one of multiple sources in a heterogeneous field. While Nonaka with his various co-authors popularised a partial account of Polanyi's distinction between tacit and explicit knowledge, other thinkers and practitioners drew on a body of information theory that can be traced back to Shannon. Add to that the Intellectual Capital movement associated with Edvisson and Stewart which is a distinctive and persistent strand. In parallel many of us entered the field from a background in decision support and strategy.

Despite this varied background knowledge management is for good or ill defined by the technologies of its common practice; the early growth coinciding with the early development of collaboration software and the early growth of the internet and its internal corollary the intranet. Whatever the intention of its founders knowledge management was soon hijacked by the technology providers, and most programmes started with a taxonomy, progressed to communities of practice and then fell into disuse accompanied by desperate questions from well-intentioned knowledge professionals which were variations of *How do I create a knowledge sharing culture*. Curiously as the field of practice fell back to the late adopting government sector academic interest suddenly surged. It is a telling comment that at the time of writing academic conferences outweigh practitioner conferences to a significant degree.

Now, just as many of us thought knowledge management was, to quote Larry Prusak, a *Deadman walking* we are suddenly seeing a resurgence of interest associated with the growth of social computing. It is as if knowledge management has finally found a technology platform which is fluid enough to channel its promise; messily coherent, the product of voluntary adoption and above all validated, navigated and informed by social connection. For me this is best illustrated by a personal experience. Some years ago I made a very public statement at a military institution in Washington to the effect that the US Army had the best method I knew for knowledge capture, but the worst method I knew for knowledge distribution. Technology was used to capture the experience and commentary of soldiers in the field under fire, but that evocative and functional material was then distilled into doctrine and various other manifestations of what is commonly referred to as best practice. The reception to my comment was hostile to say the least, but five years later, in the same location I was told by a three star general that

the only thing which had worked in Iraq was Platoon Commanders blogging. The need was for the raw narrative of colleagues experience, not distilled and sanitized official documents, however well-meaning and professional in their creation.

Some years ago in an article *Complex Acts of Knowing* I drew on anthropology to make a critical distinction between two types of culture as follows:

- **Rule based**

The socio-cultural system or the pattern of residence and resource exploitation that can be observed directly, documented and measured in a fairly straightforward manner. The tools and other artifacts that we use to create communities, the virtual environment we create and the way we create, distribute and utilise assets within the community. These are teaching cultures that are aware of the knowledge that needs to be transferred to the next generation and which create training programmes. They are characterised by their certainty or explicit knowability.

- **Ideation based**

Cultures in this sense comprise systems of shared ideas, systems of concepts and rules and meanings that underlie and are expressed in the ways that humans lived. Culture, so defined, refers to what humans learn, not what they do and make. Such cultures are tacit in nature: networked, tribal and fluid. They are learning cultures because they deal with ambiguity and uncertainty originating in the environment or self-generated for innovative purposes

If we look at the pattern of knowledge management activity over the last two decades we can see the domination of the rules based approaches. The creation of taxonomies appeals to the western tendency to categorise material to death; taxonomy and taxidermy not only sound the same but produce similar results namely a static and retrospective snap show on what we knew, rather than what we know or may need to know. Formal communities of practice cater to the structured and explicit aspects of the organisation. Best practice documents in creation and promulgation focus on transfer of knowledge seen as a *thing*, an object with discrete boundaries that exists independently of its social context. Trust is formal, assumed by virtue of status and the various validation processes that allow material to be published.

Such an approach has much to commend it, within boundaries. For the stable aspects of information and knowledge within an organisation the process of codification, validation and authentication is key to ensure quality, legal compliance and the like. However it could not, and *a priori* cannot satisfy the needs for knowledge flow to support decision making under conditions of uncertainty and innovation.

If we look at probably the most successful method for knowledge transfer that has evolved in human society, namely apprentice schemes we can see that the emphasis is primarily on ideation based culture. Yes there is formal teaching, but much of the learning comes from tolerated failure, imitating the master's work, modifying it to match as yet under developed capabilities, talking with other apprentices, learning from them. After a period, the ritual walking of the tables indicates the achievement of journeyman status, where greater autonomy also carries with it teaching duties and community responsibilities. The field of work associated with an apprentice model is not static, it is constantly evolving through social interaction and social convention. Knowledge is a series of flows within a social context.

Social computing in many ways mimics these environments but is informed and enabled by what I call the publishing paradigm, a focus on push rather than pull in creating authority. Those who publish interesting material in their blogs, or say/link to interesting things in tweets build networks of influence in which learning takes place. The powerful bloggers are the new masters in a modern and distributed system of learning. Anyone who blogs frequently will tell you that they mix formal material with insights and indiscretions into their own histories and beliefs. Without the seasoning of personal revelation there is no social connection, excessive revelation on the other hand is self-indulgent and the sphere of influence contracts. I used my own twitter network recently to solve a complex issue relating to translation of Urdu in a project in crisis. The network created by the publishing paradigm had sufficient variety and connectivity to respond to a need. Like many people I often use Twitter in preference to Google to find key information; it is a socio-technical system not a semantic engine. These environments mimic the common room and the water cooler but extend over both time and space to magnify their utility a thousand fold.

Related to this we have the major shift from application dominated architectures to architectures in which applications evolve through the interaction of objects both software and human in nature. The growth of enterprise wide application software is a characteristic of the period in which knowledge management technologies first emerged, and their early development mimicked those products. Requirements were captured through interview processes, designs were produced, software selected or built and implementation plans produced. When things failed to survive beyond the initial hawthorn effect phase, cultural change and other programmes were run in a futile attempt to force or cajole participation. Now contrast that with social computing. A typical desk top contains multiple applications that interact with each other seamlessly. No one uses Twitter directly, they use independently developed twitter clients such as Nambu. RSS readers are changed frequently and often on a whim. New methods emerge (they are never designed) such as hash tags in Twitter, that enable new pathways in unexpected and serendipitous ways. The environment is messy, but it is coherent and it works.

One of the main reasons for this success is that the environment has a light constraint structure in place. Without any constraint evolution of meaning is not possible; with heavy constraint we only replicate what we already know without novelty or the emergence of insight. As such the systems now more closely reflect the tribal and clan nature of humans: over 90% of our genetic history is as Pliocene hunter gathers, a simple fact that we should try to remember. Our brains are pattern based intelligences, we don't process information with any ease. We *conceptually blend* patterns in novel and interesting ways to innovate in the context of threat or opportunity. The micro-narratives of day to day existence are still the primary method of knowledge transfer from the expert engineer to the shopping queue. We are *homo narrans* not *homo economicus* in our hearts as well as our minds. From neuro-science we know that human consciousness is a distributed function, it is not confined to the brain but extends over the hormonal and muscular systems as well as into the wider environment. That extended and intertwined network of coherence is an essential feature of human intelligence and capability.

Technology can augment human intelligence, it cannot replace it; unless that is we dumb down our intelligence and capability to the autistic linear processes that were all to characteristic of knowledge management in its first two decades. We need to learn to embrace uncertainty not to reduce it, to understand that messy environments are natural to humans as they allow discovery in the context of current need. We need to move from futile attempts at anticipation, to initiating states of anticipatory awareness

in which social networks respond to the unanticipated; above all we need knowledge management to demonstrate wisdom by creating a synthesis of technology and human capability.

Dave Snowden

Founder and Chief Scientific Officer of Cognitive Edge

Dave Snowden is the founder and chief scientific officer of Cognitive Edge. His work is international in nature and covers government and industry looking at complex issues relating to strategy, organisational decision making and decision making. He has pioneered a science based approach to organisations drawing on anthropology, neuroscience and complex adaptive systems theory. He holds visiting Chairs at the Universities of Pretoria and Hong Kong Polytechnic Univeristy as well as a visiting fellowship at the University of Warwick. He is a senior fellow at the Institute of Defense and Strategic Studies at Nanyang University and the Civil Service College in Singapore. His paper with Boone on Leadership was the cover article for the Harvard Business Review in November 2007 and also won the Academy of Management award for the best practitioner paper in the same year. He has previously won a special award from the academy for originality in his work on micro narrative. He is a editorial board member of several academic and practitioner journals in the field of knowledge management and is an Editor in Chief of E:CO. In 2006 he was Director of the EPSRC (UK) research programme on emergence and in 2007 was appointed to an NSF (US) review panel on complexity science research. He previously worked for IBM where he was a Director of the Institution for Knowledge Management and founded the Cynefin Centre for Organisational Complexity; during that period he was selected by IBM as one of six “on-demand” thinkers for a worldwide advertising campaign.

Preface

TOWARD AN UNDERSTANDING OF SOCIAL KNOWLEDGE

The Challenge

For the past two decades, executives have struggled to develop effective ways of sharing what their organizations know. Organizational leaders are now seeking ways to share knowledge with both internal and external stakeholders driven by concerns such as downsizing, the impending retirement of baby boomers, terrorism, and a host of other organizational challenges. Despite the best efforts of many innovative leaders, few organizations have achieved the desired level of knowledge sharing. This is certainly not due to a lack of energy, enthusiasm, or excitement on the part of managers, but rather the result of immature, complicated, and expensive tools, techniques, and technologies. Equally, a culture based on a need-to-know rather than one based on a need-to-share prevented the transparency necessary to achieve organizational knowledge goals.

Today we are seeing some very promising results from third-generation knowledge projects, which focus on connecting people and facilitating collaboration. Many organizations are now reaping the benefits of using social media such as wikis for collaboration and social networking tools for connecting people. These emerging tools and techniques provide flexible, agile, and intuitive solutions for connecting people with people and facilitating coordination, communication, and collaboration (Girard & Girard, 2009).

Unlike first-generation knowledge projects, which focused on collecting and capturing knowledge, or second-generation projects, which sought to codify tacit knowledge, these third-generation projects are very social in nature. The projects seek to connect people with people who in turn will share what they know. Although much of what they know is in the tacit form the projects do not rely on codification but rather connection. Consider the following quote from *Clever : Leading your smartest, most creative people*, which emphasises our point:

The knowledge of clever people is tacit. It is embedded in them. If it were possible to capture their knowledge within the organizational fabric, then all that would be required would be better knowledge management systems. It isn't. (In fact, as alluded to by Kamlesh Pande [an HR manager in organization under study], one of the great disappointments of knowledge management initiatives to date is their failure to capture clever knowledge.) For the people we are talking about, a great deal of their cleverness resides not in what they know but who they know and how they know it (Goffee & Jones, 2009)

The focus of this book is third-generation knowledge projects. Our interest, like many organizational leaders, is how we can apply the social tools, techniques, and technologies to better know what we know. This quest, knowing what we know from an organizational point of view, is not new. Carla O'Dell and Jack Grayson (1998), authors of *If Only We Knew What We Know*, empowered many organizational leaders by outlining successes in the transfer of internal knowledge. Their pioneering work sparked a knowledge revolution that substantially enhanced the state of knowledge management in many organizations. Today we are ready for the next revolution, one that focuses on the social side of knowledge transfer.

The Wisdom of Many

As is often the case when the academic and business worlds collide, there is some debate about the exact meaning of the term *Social Knowledge*. We do not attempt to curtail this debate, as it would be premature to expect consensus in this nascent field. That said, we did provide the following definition to the chapter authors to begin the debate:

Social Knowledge is the use of social media to create, transfer, and preserve organizational knowledge – past, present, and future – with a view to achieving the organizational vision.

This book is particularly unique in several distinct ways. First, this is one of the very first collections to consider what leaders should be doing today to enhance the intellectual capital of their organization through the strategic use of social media. Second, the book considers social knowledge in the broadest possible way. To be sure, some will question the breadth and depth of the domain as articulated by the authors. In fact, as we launched this book we underestimated the scope of the domain and we have been surprised at how many innovative tools, techniques, and technologies are in place or under consideration. Third, this book includes chapters from a diverse group of interested parties; this diversity is geographic, linguistic, professional, and experiential.

The book is organized into 15 chapters based on our definition of social knowledge. The first five chapters chronicle social knowledge in action. The next four chapters focus on the cultural components of social knowledge. The final six chapters examine social knowledge tools, techniques, and technologies. Together these three sections provide an exciting look at how executives may use the enablers and components to achieve their organizational vision.

Section 1: Social Knowledge in Action

In **Chapter 1**, David and Alex Bennet (2011) explore the factors and conditions which influence the social creation and sharing of knowledge. Their exploration includes clear definitions of information, knowledge and learning. The Bennets discuss social interaction, including environmental impacts on the creations and sharing of knowledge and they close with an insightful examination of the individual learning and knowledge activity at the societal level.

In **Chapter 2**, Kimiz Dalkir (2011) focuses on how social network analysis (SNA) can be used to assess the quantity and quality of connection, communication and collaboration mediated by social tools in an organization. A real-life case study illustrates how SNA can be used in a pre-test/post-test evaluation design to conduct a comparative assessment of methods that can be used before, during and

after the implementation of organizational change in work processes. Dalikr suggests SNA is a good candidate to analyze the connections between people and content as well as people with other people.

In **Chapter 3**, Suzanne Roff-Wexler, Loretta L. Donovan, and Salvatore Rasa (2011) explore the assumptions we make, the questions we ask, and the “social knowledge” we use to make decisions about our personal and business lives. Personal experiences and anecdotes provide context for scholarly ideas and references. The chapter offers its readers a method to continue the dialogue.

In **Chapter 4**, Cindy Gordon (2011) argues that innovation growth is tightly tied to the collaborative process of socializing knowledge. In this chapter, Gordon tells the story of change agents that are helping to move from vision to execution successfully. Each of her cases is rooted in a clear business need either for employee engagement or customer engagement needs.

In **Chapter 5**, Benjamin Hentschel and Parissa Haghirian (2011) describe a qualitative study conducted in a Japanese organization. Specifically, they investigate the extent to which social knowledge influences communicative behavior, and looks at the implications for organizational communication patterns in Japan. The findings of this study point towards changing patterns of social knowledge in Japanese firms.

Section 2: Cultural Aspects of Social Knowledge

In **Chapter 6**, Andrew Miller (2011) considers what cultural barriers are being raised against social media adoption and how can management re-align their understanding of social media to better utilize resources and take advantage of the opportunities this technology presents? He describes how organizations who harness the massive data warehouses behind social media networks have the ability to significantly alter individual lives and society at large; for better or worse.

In **Chapter 7**, Paul McBride (2011) describes how and why organizational culture is paramount towards endeavors of social knowledge and knowledge management systems. He argues that a culture based on honesty, trust, and openness is best suited for knowledge management. McBride suggests organizations that employ social media to aid in culture development will build systems of knowledge management that lead to competitive advantage.

In **Chapter 8**, Scott Mackintosh (2011) describes the military’s approach to social media and outlines the security controversy it views as an inherent issue associated with condoning and promoting the use of social media. He discusses the use of social media as a vehicle of transformational leadership. Mackintosh makes recommendations to facilitate a better adoption of various forms of social media by the military.

In **Chapter 9**, Nhu T. B Nguyen and Katsuhiko Umehoto (2011) conducted the first study that investigated the process of cross-cultural knowledge creation and the role of leadership in this process. Their findings will contribute to developing KM in a new way that can be applied to practices in utilizing and creating cross-cultural knowledge for KM activities. In addition, they offer many practical implications for leaders to manage effectively cross-cultural knowledge of members in organizations.

Section 3: Social Knowledge Tools, Techniques, and Technologies

In **Chapter 10**, Stefania Mariano (2011) provides a practical approach for managing social media. Her study investigates how knowledge is created, transferred, and shared in social media and proposes a way to manage social knowledge. Mariano’s findings revealed that knowledge transfer was the primary

knowledge process in the management of the Web log and highlighted common issues, concerns, and suggestions on how to develop a more effective virtual social environment.

In **Chapter 11**, Nick Bowersox (2011) provides practical ways in which the United States Air Force can increase participation in Virtual Communities of Practice (VCoPs) among its workforce, as well as providing theoretical frameworks upon which further research can be conducted. He proposes a set of testable propositions that may serve as the basis for future research.

In **Chapter 12**, Jagdish K Vasishtha (2011) discusses the needs of knowledge workers for effective knowledge capture and team collaboration. His analysis considers knowledge fragmentation due to technology, relevancy of information to a user, and Push vs. Pull approaches of accessing information. He also explores how these challenges can be addressed by social knowledge workspaces and what should be some of the key characteristics of these technologies under development.

In **Chapter 13**, Haris Papoutsakis (2011) evaluates the contribution of shared knowledge and information technology to manufacturing performance. His findings are useful to researchers and the business community alike as they may be used as a springboard for further empirical studies and can help put together strategies involving knowledge management and information technology.

In **Chapter 14**, Chethan M and Mohan Ramanathan (2011) explore the convergence of many ideas and innovations and the technology that is building these networks. They argue that social networks have changed the way people connect, redefining the knowledge value system that is being shared without borders or limits.

In **Chapter 15**, Fjodor Ruzic (2011) suggests that social knowledge is not a new category; however, in these times of information-communications systems maturity, it becomes an extremely important and valuable asset. He finds that in the context of social knowledge, information technology should be constantly harmonized with cultural milieu characterized mostly by invisible culture and its actions.

REFERENCES

Bennet, D., & Bennet, A. (2011). Social Learning from the Inside Out: The Creation and Sharing of Knowledge from the Mind/Brain Perspective. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.

Bowersox, N. (2011). Encouraging Participation in Virtual Communities of Practice within the United States Air Force. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.

Dalkir, K. (2011). Measuring the Impact of Social Media: Connection, Communication and Collaboration. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.

Girard, J. P., & Girard, J. L. (2009). *A Leader's Guide to Knowledge Management: Drawing on the Past to Enhance Future Performance*. New York: Business Expert Press.

Goffee, R., & Jones, G. (2009). *Clevr : leading your smartest, most creative people*. Bostons.MA: Harvard Business Press.

- Gordon, C. (2011). Social Knowledge Case Study: Innovation Linked to the Collaborative Socialization of Knowledge. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Hentschel, B., & Haghirian, P. (2011). Social Knowledge in the Japanese Firm. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- M, C. & Ramanathan, M. (2011). Social Knowledge: The Technology behind. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Mackintosh, S. (2011). Social Leadership: Exploring Social Media and the Military – A New Leadership Tool. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Mariano, S. (2011). Becoming a Blogger: A Social Knowledge Experiment. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Miller, A. (2011). Cultural Barriers to Organizational Social Media Adoption. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- McBride, P. (2011). Organizational Culture: A Pillar for Knowledge Management. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Nguyen, N., & Umemoto, K. (2011). Foundations of Cross-Cultural Knowledge Management. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- O'Dell, C., Grayson, C. J., & Essaides, N. (1998). *If only we knew what we know: the transfer of internal knowledge and best practice*. New York: Free Press.
- Papoutsakis, H. (2011). Sharing Scientific and Social Knowledge in a Performance Oriented Industry: An Evaluation Model. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Roff-Wexler, S., Donovan, L., & Rasa, S. (2011). Challenging our Assumptions: Making Sense of the Sharing of Social Knowledge. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Ruzic, F. (2011). Empowering Social Knowledge with Information Technology: Technological and Cultural Issues Convergence. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Vasishtha, J. (2011). Social Knowledge Workspace. In Girard, J. P. & Girard, J.L. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.

John P. Girard
 Minot State University, USA

JoAnn L. Girard
 Sagology, USA

Acknowledgment

We would like to acknowledge and thank all of those involved in the development of this book. The entire team at IGI Global was very supportive and helpful. In particular, we wish to thank Julia Mosemann, the Development Editor at IGI Global. Her patience was amazing (and appreciated) while her guidance was always timely, useful, and valued.

The team of reviewers deserves special attention as they very generously provided their time and expertise to ensure a high-quality review process. Often the work associated with chapter review is underestimated and forgotten – thanks to all of you for your great work.

Thank you also to the Advisory Board members, all of whom helped us bring you this collection of thoughts about Social Knowledge. Each of the Board members is a very busy expert in their field and we certainly appreciate their participation in this project.

Finally, we would like to thank the leading researchers and practitioners who contributed chapters to this book. They generously volunteered their intellectual capital and were brave enough to share their initial thoughts about this emerging and exciting domain. Without their insights, this book would simply not be possible.

John P. Girard
Editor
john@johngirard.net
www.johngirard.net

JoAnn L. Girard
Editor
joann@sagology.com
www.sagology.com

Section 1
Social Knowledge in Action

Chapter 1

Social Learning from the Inside Out: The Creation and Sharing of Knowledge from the Mind/Brain Perspective

David Bennet

Mountain Quest Institute, USA

Alex Bennet

Mountain Quest Institute, USA

ABSTRACT

This chapter explores from the viewpoint of the mind/brain the factors and conditions which influence the social creation and sharing of knowledge. A foundation is developed by providing clear definitions of information, knowledge and learning, including levels of knowledge and the process through which the mind/brain creates new knowledge. Then neuroscience findings are used to discuss social interaction, including environmental impacts on the creation and sharing of knowledge. Factors such as arousal and stress level, social attunement, holding environment, intersubjective space, level of trust, social bonding, and an enriched external environment are posited to enhance the creation and sharing of knowledge. Finally, the individual learning and knowledge activity is extrapolated to the societal level through a short introduction to collaborative entanglement (learning to create and apply knowledge as communities), and the use of metaphor and story. Summary highlights of neuroscience findings are also provided.

INTRODUCTION

We are social creatures. While this concept has been around for centuries, Cozolino believes that we are just waking up to this fact from a biological perspective. As he describes,

As a species, we are just waking up to the complexity of our own brains, to say nothing of how brains are linked together. We are just beginning to understand that we have evolved as social creatures and that all of our biologies are interwoven. (Cozolino, 2006, p. 3)

DOI: 10.4018/978-1-60960-203-1.ch001

While humans have studied the brain since ancient Greece and perhaps before that, neuroscience is a very young field. Although an association of professional scientists known as The Society for Neuroscience was formed in 1970 (Bear, Connors, & Paradiso, 2001), it wasn't until the development of measurement and excitation technology (George, 2007; Ward, 2006) in the early 1990s that the field began to flourish. Examples of these technologies include functional magnetic resonance imaging (fMRI), the electroencephalograph (EEG), and transcranial magnetic stimulation (TMS); (George, 2007; Kurzweil, 2005; Ward, 2006). fMRI is used for neuroimaging to produce precise measurements of brain structure activity (Hyman, 2007). EEG is another noninvasive technique that measures the average electrical activity of large populations of neurons (Nicoletis and Chapin, 2007). TMS uses head-mounted wire coils that send very short but strong magnetic pulses directly into specific brain regions that induce low-level electric currents into the brain's neural circuits, and appears to be able to "turn on and off particular parts of the human brain" (George, 2007, p. 21).

Simultaneously, because of increasing computational power, the field of neuroanatomy has become a central aspect of neuroscience. Neuroanatomy is the branch of anatomy that deals with the nervous system. The first comprehensive volume in this field, edited by Giorgio Ascoli, head of the Krasnow Institute for Advanced Study at George Mason University and published in 2002, defines this field as, "... the use of computer models, simulations, and visualizations to gain a deeper understanding of the complexity of nervous system structures" (p. v).

Collectively, these advancements are steadily providing new information on how the mind/brain works. The term "mind/brain" connotes the combination of the physiological brain and the mind, that is, the patterns of neuron connections, the strengths of those connections, and the signals they send to other neurons that exist in

the brain. The neuroscience findings that have emerged since the 1990's form the foundation of this paper. With learning and knowledge at the core of our exploration, we will (1) develop a common understanding of baseline definitions; (2) discuss the creation and sharing of knowledge from the viewpoint of the mind/brain; (3) discuss social interaction and the mind/brain, including environmental impacts on the creation and sharing of knowledge; and (4) extrapolate the individual learning and knowledge activity to the societal level through a short introduction to collaborative entanglement (learning to create knowledge as communities), and then the use of metaphor and story.

DEVELOPING A COMMON UNDERSTANDING

Embracing Stonier's description of information as a basic property of the Universe—as fundamental as matter and energy (Stonier, 1990; Stonier, 1997)—we take the amount of information to be a measure of the degree of organization expressed by any non-random pattern or set of patterns. The order of a system is a reflection of the information content of the system. Data (a form of information) would then be simple patterns, and while data and information would both be patterns, they would have no meaning until some organism recognized and interpreted the patterns (Bennet and Bennet, 2006a, 2008c). Thus knowledge exists in the human brain in the form of stored or expressed neuronal patterns that may be activated and reflected upon through conscious or unconscious thought. This is a high-level description of the creation of knowledge that is consistent with the neuronal operation of the brain and is applicable in varying degrees to all living organisms. From this process neuronal patterns are created that may represent understanding, meaning and the capacity to anticipate (to various degrees) the results of potential actions. Thus it is not just information

that characterizes knowledge, but the relationships or associations (in space and time) among that information. Through this process of associating (or complexing), the mind is continuously growing, restructuring the physiology of the brain, creating increased organization (information), and by doing so, changing.

Taking a functional approach, our definition of knowledge then becomes: *knowledge is the capacity (potential or actual) to take effective action in varied and uncertain situations* (Bennet and Bennet, 2004). Knowledge consists of comprehension, understanding, meaning, insight, intuition, creativity, judgment, and the ability to anticipate the outcome of our actions. Recognizing that knowledge is the result of associative patterning in the brain and consistent with our understanding of information and that the relationships among information define knowledge, we choose to consider knowledge as comprised of two parts: Knowledge (Informing) and Knowledge (Proceeding). This also builds on the distinction made by Ryle (1949) between “knowing that” and “knowing how”.

Knowledge (Informing), or Kn_i , is the *information (or content)* part of knowledge. While this information part of knowledge is still generically information (organized patterns), it is special because of its structure and relationships with other information. Kn_i consists of information that represents insights, meaning, understanding, expectations, theories and principles that support or lead to effective action. When viewed separately this is information that *may* lead to effective action. However, it is considered knowledge when it is used as *part of the knowledge process*.

Knowledge (Proceeding), Kn_p , represents the *process and action* part of knowledge. Kn_p is the process of selecting, associating and applying the relevant information (Kn_i) from which specific actions can be identified and implemented, that is, actions that result in some level of effective outcome. There is considerable precedence for considering knowledge as a process versus an

outcome. As Kolb (1983) forwards in his theory of experiential learning, knowledge retrieval, creation and application requires engaging knowledge as a process, not a product. The process our minds use to find, create and semantically mix the information needed to take effective action is often unconscious and difficult to communicate to someone else. The more complex a situation, the more difficult to find a solution, and the larger the role played by tacit knowledge in our unconscious mind (Goldberg, 2005; Bennet and Bennet, 2008b).

Knowledge can also be considered in terms of surface, shallow and deep levels. Surface knowledge is predominantly but not exclusively information. Answering the question of what, when, where and who, it is primarily explicit, and represents visible choices that require minimum understanding. Further, little action is typically required; it is more of an awareness of *what is* on the part of the receiver.

Surface knowledge in the form of information can be stored in books and computers, and the mind/brain. Much of our everyday life such as light conversations, descriptions and even self-reflection could be considered surface thinking and learning that creates surface knowledge. Perhaps too much of what is taught in schools is focused on awareness and memorization (surface knowledge) with inadequate focus on understanding or meaning. For example, the National Research Council has expressed concern that the U.S. education system teaches students science using a mile wide and inch deep approach (National Research Council, 2000; Oakes and Lipton, 1999). The emphasis is on surface learning, that is, learning that “relies primarily on short term memorization—cramming facts, data, concepts and information to pass quizzes and exams... deep learning asks that we create and re-create our own personal understanding” (Chickering et al., 2005, pp. 132-133). Further, surface knowledge is frequently difficult to remember and easy to forget because it has little meaning to improve recall,

and few connections to other stored memories (Sousa, 2006).

Shallow knowledge is when you have information plus some understanding, meaning and sense-making. To understand is to make some level of meaning, with meaning typically relating to an individual or organization and implying some level of action. To make meaning requires context; meaning is something the individual creates from the received information and their own internal information, a process of creating Kn_p . Shallow knowledge requires a level of understanding and meaning such that the knowledge maker can identify cohesion and integration of the information in a manner that makes sense. This meaning can be created via logic, analysis, observation, reflection, and even—to some extent—prediction. In an organizational setting shallow knowledge emerges (and grows) through social interactions as employees move through the processes and practices of the organization. For example, organizations that embrace the use of teams and communities facilitate the mobilization of knowledge and the creation of new ideas as individuals interact in those groups.

With deep knowledge one has developed and integrated many if not all of the following seven components: understanding, meaning, insight, creativity, intuition, judgment, and the ability to anticipate the outcome of one's actions. Deep knowledge represents the ability to shift your frame of reference as the context and situation shift. Since Kn_p must be created in order to know when and how to take effective action, the unconscious plays a large role in this area. The source of deep Kn_p lies in your creativity, intuition, forecasting experience, pattern recognition, and use of theories (also important in shallow knowledge situations). Deep knowledge is the realm of the expert. The expert's unconscious has learned to detect patterns and evaluate their importance in anticipating the behavior of situations that are too complex for the conscious mind to understand. During the lengthy period of practice needed to develop deep

knowledge—a “lived” experience—the expert has often developed an internal theory that guides her Kn_p . Gathered through what is called *effortful practice* through a process of chunking, much of this knowledge resides within the unconscious and surfaces only when the individual takes an action or makes a decision based on “feel” or “intuition.”

Learning is the process of creating knowledge (the capacity to take effective action). From an evolutionary perspective, those individuals who could observe, experience and take the best actions—whether it was to take flight, attack, or hide—had the best chance of survival. This capability to understand and see the meaning of a situation, and then figure out what to do and do it, we call knowledge. As the mind/brain evolved over thousands of years, it created the capacity to learn and act on what it learned. The advent of brain imaging allows us to watch the neurophysiology of learning unfold. “Not only can we trace the pathways of the brain involved in various learning tasks, but we can also infer which learning environments are most likely to be effective (Johnson and Taylor, 2006, p. 1).

While there are many ways to learn—self-reflection, observing others, our own instincts, etc.—as the value of knowledge sharing has been proven, the art of social communication and interactions has become an essential aspect of our organizations and communities. This shift has prompted an exponential growth in learning from each other, without the penalty of other individual's mistakes.

CREATING AND SHARING KNOWLEDGE IN THE MIND/BRAIN

The brain stores information in the form of patterns of neurons, their connections (synapses), small electrical pulses, and the strength between those connections. These patterns represent thoughts, images, beliefs, theories, emotions, and so on. A single thought could be represented in the brain by

Social Learning from the Inside Out

a network of a million neurons, with each neuron connecting to anywhere from 1 to 10,000 other neurons (Ratey, 2001). Although the patterns themselves are nonphysical, their existence as represented by neuronal cells and their connections *are* physical, that is, composed of atoms, molecules and cells. If we consider the mind as the totality of neuronal patterns, then we can consider the mind and the brain to be connected in the sense that the patterns (mind) cannot exist without the brain (atoms, molecules, and neuronal cells), yet the brain would have no mind if it had no neuronal patterns. We have previously used a metaphor to understand this relationship: The mind is to the brain as waves of the ocean are to the water in the ocean (Bennet and Bennet, 2008c). Even this is simplified because surrounding the neurons are other cells and continuous flows of blood, hormones, and other chemicals which have complex interactions within the brain (Pert, 1997; Church, 2006). The power of the metaphor derives from the relationship between the neuronal network patterns used to represent the external (and internal) world of concepts, thoughts, objects, and relationships and the physical neurons and other material in the brain.

To get some idea of the density and intricacies of the brain, consider the following: “A piece of brain tissue the size of a grain of sand contains a hundred thousand neurons and one billion synapses, all talking to one another” (Amen, 2005, p. 20). As another example, consider the following description of how the brain creates patterns of the mind. Antonio Damasio uses the term “movie” as a metaphor for the diverse sensory images and signals that create a show and flow we call mind. In the following quote Damasio also brings out a few of the large number of semi-independent systems in the brain that work together to make patterns that make sense of our external environment.

Further remarkable progress involving aspects of the movie-in-the-brain has led to increased insights related to mechanisms for learning

and memory. In rapid succession, research has revealed that the brain uses discrete systems for different types of learning. The basal ganglia and cerebellum are critical for the acquisition of skills—for example, learning to ride a bicycle or play a musical instrument. The hippocampus is integral to the learning of facts pertaining to such entities as people, places or events. And once facts are learned, the long-term memory of those facts relies on multi-component brain systems, whose key parts are located in the vast brain expanses known as cerebral cortices. (Damasio, 2007, pps. 63-64)

We learn by changing incoming physical signals (images, sounds, smells, sensations of the body) into patterns (of the mind and within the brain) that we identify with specific external concepts, objects, or relationships. These incoming neuronal patterns have internal associations with other internal patterns that represent (to varying degrees of fidelity) the corresponding associations in the external world. Thus we re-present external reality through the creation and association of internal patterns of neuron firings and connections. Stonier (1997) refers to this process as semantic mixing or complexing.

Incoming external information (new information) is mixed, or associated, with internal information, creating new neuronal patterns that may represent understanding, meaning, and/or the anticipation of the consequences of actions, in other words, knowledge (Stonier, 1997). The term *associative patterning* describes this continuous process of learning by creating new patterns of the mind and stored in the brain (Bennet and Bennet, 2006a, 2008c). From the viewpoint of the mind/brain, any knowledge that is being “re-used” is actually being “re-created” and, in an area of continuing interest, most likely complexed over and over again as incoming information is associated with internal information (Stonier, 1997). During reflection, the mind/brain is thinking about the incoming concepts, ideas, objects, and their

relationships by associating them with various internal neuron patterns.

If Knowledge (Informing) is different, there is a good chance that Knowledge (Proceeding) will be different. Recall that Knowledge (Proceeding) is the *process* of pulling up and sequencing associated Knowledge (Informing) and semantically complexing it with incoming information to make it comprehensible. In essence, every time we apply knowledge (Informing and Proceeding) it is to some extent new knowledge because the human mind—unlike an information management system—*unconsciously tailors what is emerging as knowledge to the situation at hand* (Edelman & Tononi, 2000). See Bennet and Bennet (2008a) for an in-depth treatment of knowledge reuse.

A significant aspect of the mind/brain is its capability to continually make sense of its environment and anticipate what's coming next. As Buzsaki (2006) states,

brains are foretelling devices and their predictive powers emerge from the various rhythms they perpetually generate... The specific physiological functions of brain rhythms vary from the obvious to the utterly impenetrable. (p. vii).

In other words, our behavior is closely related to our capacity to form accurate predictions. This perspective is reinforced by the neuroscientist Rudolfo Llinas (2001) who considered predicting the outcome of future events as the most important and common of all global brain functions. The sense of movement of the body provides a simple demonstration of the need—and power—of anticipating the future. Imagine walking down a staircase and accidentally missing a step, recognizing the surprise one has when beginning to fall (Hawkins, 2004). Since for thousands of years survival has depended upon humans being capable of anticipating their environment and taking the right actions to survive, perhaps it should be no surprise that that capability has come through the evolution of the brain. As Damasio explains,

survival in a complex environment, that is, efficient management of life regulation, depends on taking the right action, and that, in turn, can be greatly improved by purposeful preview and manipulation of images in mind and optimal planning. Consciousness allowed the connection of the two disparate aspects of the process—inner life regulation and image making. (Damaso, 1999, p. 24)

One way the brain anticipates the future is through the process of storing sequences of patterns. Since we never see the same world twice, the brain (as distinct from a computer) *does not store exact replicas* of past events or memories. Rather, it stores invariant representations. These forms represent the basic source of recognition and understanding of the broader patterns (Hawkins, 2004).

Marchese (1998) points out, when you see a picture, only about 20% of what you are seeing is brought into your brain; the other 80% of that image comes from information, ideas, and feelings *already in your brain*. The point is that the mind/brain doesn't store memories like a computer, that is, storing everything that comes in. It stores the *core* of the picture, what was referred to above as an invariant (Hawkins, 2004).

For example, if you see your friend from the side or back you can usually recognize who they are since your mind has stored a core basic memory that includes major features of that person (Begley, 2007; Hawkins, 2004). When you see your friend, your mind is filling in the blanks and you recognize the incoming image as your friend. There is also robustness in the way the brain *stores* core memories. Assume that it takes a million neurons to create a specific pattern (the core part of incoming information), the brain may set aside 1.4 million neurons with their connections as space for that pattern, providing a looseness to account for future associative changes, or dying cells (Hawkins, 2004). Thus for this particular pattern you could lose tens of thousands of brain

cells related to the pattern and still have significant aspects of the core memory available for future retrieval via re-creation.

Further complicating the situation, at the same time you catch sight of your friend and are smiling, getting ready to call out and wave, you may be swatting gnats away from your eyes, shivering from a soft breeze, registering the dark clouds moving in from the west, feeling hunger pains in your stomach, and sensing a soreness in your little toe from tight shoes, and so on. The brain is multidimensional, simultaneously processing visual, aural, olfactory, and kinesthetic sensory inputs and, as discussed above, combining them with mental thoughts and emotional feelings to create an internal perception and feeling of external awareness (Bennet, 2006).

According to Hawkins (2004), “the problem of understanding how your cortex forms invariant representations remains one of the biggest mysteries in all of science” (p. 78). It is so much so that “no one, not even using the most powerful computers in the world, are able to solve it. And it isn’t for a lack of trying” (p.78). As the Nobel Laureate Eric Kandel explains,

By storing memories in invariant forms, individuals are able to apply memories to situations that are similar but not identical to previous experiences. Cognitive psychologists would describe this as developing an internal representation of the external world, a cognitive map that generates a meaningful image or interpretation of our experience. (Kandel, 2006, p. 298)

As discussed above, the brain is simultaneously identifying and storing core patterns (invariant forms) from incoming information; in other words, there is a hierarchy of information (Bennet and Bennet, 2006b) where hierarchy represents “an order of some complexity, in which the elements are distributed along the gradient of importance” (Kuntz, 1968, p. 162). A hierarchy of knowledge is analogous to the physical design of the neocortex,

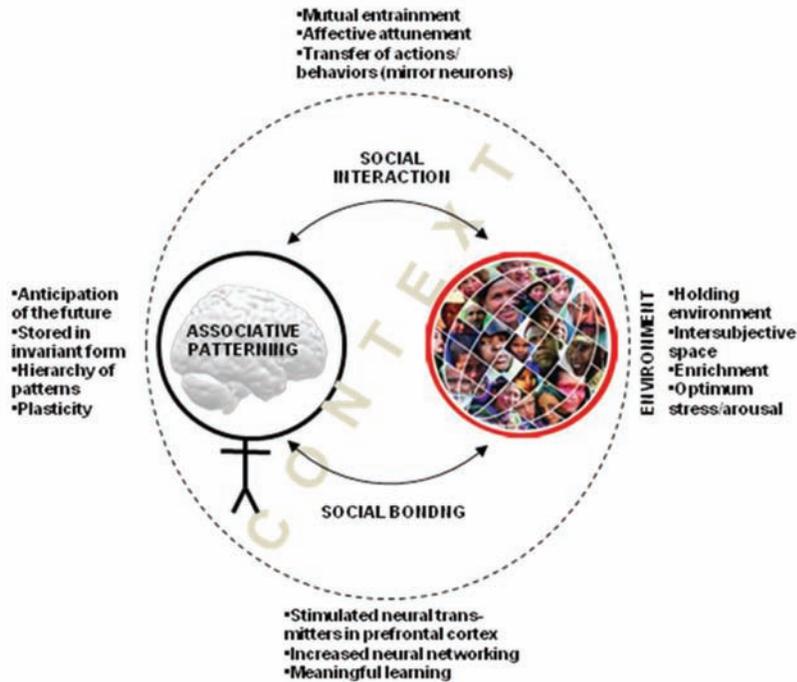
“a sheet of cells the size of a dinner napkin as thick as six business cards, where the connections between various regions give the whole thing a hierarchical structure” (Hawkins, 2004, p. 109).

In a hierarchy the dominant structural element may be a central point such as in a circular structure, or have an axial symmetry. Wherever the central point (dominant structure) is located, each part is determined by where it is located in relation to that central point. While it is true that in a radial version of hierarchy the entire pattern may depend directly on the open center, most hierarchies consist of groups of subordinate hierarchies who in turn have groups of subordinate hierarchies, with each group having its own particular relation to the dominant center point (Kuntz, 1968). The higher-level pattern stored in the brain could be described as a pattern of patterns with possibly both hierarchical and associative relationships to other patterns. See Bennet and Bennet (2006b) for an in-depth treatment of hierarchy as a learning platform.

Considering the brain as a semi-independent subcomponent of the body that contains a hierarchy of patterns associated with other patterns, the higher level (core) patterns would retain their associations (in terms of meaning, understanding, and anticipation of the future) even as the lower level patterns (internal information that is situation dependent) are re-created in response to new incoming information. A recent study of chess players showed that experts examined the chessboard patterns (not the pieces) over and over again, looking at nuances, generally “playing with” and studying these *patterns*. Ross (2006) noted that their ability to chunk patterns for ease of memory and retrieval was a significant part of their success.

The above discussion brings home the fact that the mind/brain develops robustness and deep understanding derived from its capacity to use past learning and memories to complete incoming information and instead of storing all the details, it stores only meaningful information.

Figure 1. Social creation of knowledge



This provides the ability to create and store higher level patterns while simultaneously semantically complexing incoming information with internal memories, adapting those memories to the situation at hand. Through these processes the brain supports survival and sustainability in a complex and unpredictable world. How do these mental processes affect social learning and information exchanges? Figure 1 is a graphical overview of several key factors of associative patterning and their relationship to the social creation of knowledge discussed in the following section.

SOCIAL INTERACTION AND THE MIND/BRAIN

When two people meet there may be a large amount of information (and only information) exchanged between them. Visibly, when they first see each other, light waves (or photons) travel

between them, communicating patterns of movement, colors, pictures such as facial expressions, and sound waves as they speak or walk. Each person automatically creates in their own mind images, thoughts, feelings and an overall “sense” regarding the entire situation, including the surrounding environment. Much of this information is automatically processed by our unconscious, sometimes influencing our behavior and feelings before we become conscious of them.

All of this is primarily information (ordered patterns) or, at best, what could be called surface knowledge. It is not shallow or deep knowledge as described above. These latter knowledges can only be created by each person within their own mind/brain by thinking about the information coming in through the senses. Since we each have unique autobiographies, different belief systems and personal goals, to create knowledge (that is, understanding, meaning, insight, etc.) we must mix the incoming information with our own internal

Social Learning from the Inside Out

thought patterns as discussed above. This mixing process is most effective if there is a dialogue or affirmative inquiry process between two people.

Amen (2005) says that physical exercise, mental exercise and social bonding are the best sources of stimulation of the brain. Social neuroscience is the aspect of neuroscience dealing with the brain mechanisms of social interaction. Studies in social neuroscience have affirmed that over the course of evolution physical mechanisms have developed in our brains to enable us to learn through social interactions. Johnson says that “these physical mechanisms have evolved to enable us to get the knowledge we need in order to keep emotionally and physically safe” (Johnson, 2006, p. 65). She also suggests that these mechanisms enable us to:

1. Engage in affective attunement or empathic interaction and language,
2. Consider the intentions of the other,
3. Try to understand what another mind is thinking, and
4. *Think about how we want to interact.* (Johnson, 2006, p. 65)

People are in continuous, two-way interaction with those around them, and the brain is continuously changing in response. As Cozolino and Sprokay explain,

It is becoming more evident that through emotional facial expressions, physical contact, and eye gaze—even through pupil dilation and blushing—people are in constant, if often unconscious, two-way communication with those around them. It is in the matrix of this contact that brains are sculpted, balanced and made healthy. (Cozolino and Sprokay, 2006, p. 13)

Through these interactions, the genes are operating options “that are tested as an environment provides input that results in behavior” (Bownds, 1999, p. 169). Which supporting neuronal pathways become permanent depend on the

usefulness of the behavior in enhancing survival and reproduction (Bownds, 1999). During this process, social preferences are also being developed. Tallis (2002) says that people’s day-to-day social preferences are most likely influenced by unconscious learning. As he describes,

Human beings are constantly forming positive or negative opinions of others, and often after minimal social contact. If challenged, opinions can be justified, but such justifications frequently take the form of post-hoc rationalization. Some, of course, are laughably transparent. (Tallis, 2002, p. 129)

The literature suggests that there are specific changes within the brain that occur through enriched environments, that is, when the surrounding contains many interesting and thought-provoking ideas, pictures, books, statues, etc. Specifically, thicker cortices are created, there are larger cell bodies, and dendritic branching in the brain is more extensive. These are physiological changes in response to the environment, the feelings, and the learning of the participants. These changes have been directly connected to higher levels of intelligence and performance (Begley, 2007; Byrnes, 2001; Jensen, 1998). Byrnes sees the results of research on the effects of enriched environments on brain structure as both credible and well-established (Byrnes, 2001).

For example, Skoyles and Sagan presented the results of research on adolescent monkeys that suggested prefrontal cortices (considered the executive part of the human brain) respond better than other parts of the brain to an enriched learning environment. After a month of exposure to enriched environments the monkey’s “prefrontal cortices had increased their activity by some 35 percent, while those of animals not exposed to an enriched environment had slightly decreased their activity” (Skoyles & Sagan, 2002, p. 76). These researchers go on to say that, “As the most neurally plastic species, we can choose to put ourselves

in stimulus-rich environments that will increase our intelligence” (Skoyles & Sagan, 2002, p. 76).

Social forces clearly affect every aspect of our lives. As Rose (2005) describes,

The ways in which we conduct our observations and experiments on the world outside, the basis for what we regard as proof, the theoretical frameworks within which we embed these observations, experiments and proofs, have been shaped by the history of our subject, by the power and limits of available technology, and by the social forces that have formed and continue to form that history. (Rose, 2005, p. 9)

Physical mechanisms have developed in our brain to enable us to learn through social interactions. Stern (2004) says that these physical mechanisms have evolved to enable us to get the knowledge we need to keep emotionally and physically safe. These mechanisms would enable us to, “(1) engage in affective attunement or empathic interaction and language, (2) consider the intentions of the other, (3) try to understand what another mind is thinking, and (4) think about how we want to interact” (Johnson, 2006, p. 65). The physical mechanisms for this capability come from mirror neurons and also from adaptive oscillators.

Mirror neurons aid in stimulating other peoples states of mind. As Stern (2004) proposes, “This ‘participation’ in another’s mental life creates a sense of feeling/sharing with/understanding the person’s intentions and feelings” (p. 79). As Blakemore and Frith describe the phenomenon call mirror neurons,

Simply observing someone moving activates similar brain areas to those activated by producing movements oneself. The brain’s motor regions become active by the mere observation of movements even if the observer remains completely still. (Blakemore and Frith, 2005, pp. 160-161)

Further, Dobbs explains,

These neurons are scattered throughout key parts of the brain—the premotor cortex and centers for language, empathy and pain—and fire not only as we perform a certain action, but also when we watch someone else perform that action. (Dobbs, 2007, p. 22)

Zull (2002) suggests that mirror neurons are a form of cognitive mimicry that transfers actions, behaviors and most likely other cultural norms. Thus when we see something being enacted, our mind creates the same patterns that we would use to enact that “something” ourselves. While mirror neurons are a subject of current research, it would appear that they represent a neuroscientific mechanism for the transfer of tacit knowledge between individuals, or throughout a culture. Siegel suggests that mirror neurons are the way in which our social brain processes and precedes the intentional or goal-directed action of others. Thus mirror neurons link our perception to the priming of the motor systems that engage the same action. In other words, “what we see, we become ready to do, to mirror other’s actions and our own behaviors” (Siegel, 2007, p. 347).

Another mechanism that aids in the synchronism of two individuals is the adaptive oscillators that are part of our physiology. These oscillators are created by stable feedback loops of neurons. They may bring an individual’s rate of neural firing into sync with another individual. This is when two people relate well to each other and learn to anticipate each other’s actions (Stern, 2004). Buzsaki calls this phenomenon mutual entrainment, meaning a measure of stability that oscillators have when they lock in with each other (Buzsaki, 2006).

The effects of social forces, of course, are often not in conscious awareness. The role of the conscious is to connect it all together. LeDoux (1996) says that the present social situation and physical environment are part of what is connected. Following extensive research, LeDoux (1996) concluded that,

Social Learning from the Inside Out

People normally do all sorts of things for reasons they are not consciously aware of (because the behavior is produced by brain systems that operate unconsciously) and that one of the main jobs of consciousness is to keep our life tied together into a coherent story, a self-concept. It does this by generating explanations of behavior on the basis of our self-image, memories of the past, expectations of the future, the present social situation and the physical environment in which the behavior is produced. (LeDoux, 1996, p. 33).

Stonier agrees that when people are engaging in heavy duty thinking “it is not generally in terms of unlabelled images, sounds, smells, tastes or tactile experiences” (Stonier, 1997, p. 151). Stonier posits that thinking is actually talking to oneself, and that,

This ability to talk to oneself is so basic a part of our human internal information environment that it tends to shape all our thought processes. It is this fact that allows us to be so influenced by our social and cultural surroundings. (Stonier, 1997, p. 151)

Building on our earlier discussion, knowledge (understanding, meaning, insight, etc.) can be thought of as theories, beliefs, practices and experiences coupled with a whole neighborhood of associated concepts, facts, and processes that together create the understanding, meaning and insight (to take effective action) we consider knowledge. If the individual receiving information from a knowledgeable person cannot recreate the invariant forms and neighborhood, or modulate his own invariant forms and neighborhood, then little or no learning will occur. Knowledge will not be shared, that is, the receiver has not recreated the sender’s knowledge, nor is she likely to create her own comparable knowledge.

Further, knowledge is dependent on context. In fact, it represents an understanding of situations *in context*, insights into the relationships within a

system, and the ability to identify leverage points and weaknesses to recognize the meaning in a specific situation and to anticipate future implications of actions taken to resolve problems. Shared understanding is taken to mean the movement of knowledge from one person to the other, recognizing that what passes in the air when two people are having a conversation is information in the form of changes in air pressure. These patterns of change may be understood by the perceiver (if they know the language and its nuances), but the changes in air pressure do not represent understanding, meaning or the capacity to anticipate the consequences of actions. The perceiver must be able to take these patterns (information) and—interpreting them through context—re-create the knowledge that the source intended. In other words, under perfect circumstances, the content and context (information) originating at the source resonate with the perceiver such that the intended knowledge can be re-created by the perceiver.

The innate ability to evoke meaning through understanding—to evaluate, judge and decide—is what distinguishes the human mind from other life forms. This ability enables people to discriminate and discern—to see similarities and differences, form patterns from particulars, and create and store knowledge purposefully. In this human process to create meaning and understanding from external stimuli, *context shapes content*. Eight primary avenues of context patterns that may directly impact the content of a message focus on the content, setting or situation, silent attention/presence, non-voiced communications patterns, the system, personal context, unconscious processes and the overarching pattern context. An explication of these eight avenues is included below.

Context 1 focuses on the *content* itself: the specific nouns and verbs selected, the adjectives and adverbs used in the primary expression, and the structure of the sentence that support this expression. The semantics of the content is crucial but still may not be sufficient for shallow

knowledge sharing and will never be adequate for sharing deep knowledge.

Context 2 is the *setting or situation* surrounding the content of information; that is, the words and structure of the words, phrases and sentences expressed before and after the primary expression that provide further explication of the intent of content. Contexts 1 and 2 are informational in nature and directly tied to the use and rules of language.

Context 3 is that which is not expressed, not available, what we call *silent attention/presence*. Attention represents awareness and focus. Presence represents immediate proximity in terms of time or space.

Context 4 includes the non-verbal, *non-voiced communications patterns* that inevitably exist in conjunction with the content, whether face-to-face interaction, hand written exchanges, or computer supported information. This is what could be termed associated information signals. In the convention used in nonverbal communication literature, this would be encoding (expression) from the source, and decoding (interpretation) of the perceiver. These are, of course, interdependent.

Context 5 is focused on the *system* within which interaction takes place, the mutually-shared, common information and patterns with meaning *within the system*. The context of the system would include an understanding, either consciously or unconsciously, of the boundaries, elements, relationships and forces within the system.

Context 6 is the *personal context* which includes beliefs, values, experiences and feelings that emerge into conscious awareness. Personal context would also include positions that individual's take that are locked into the conscious mind, unconscious patterns that are made conscious by the emerging content of the message (what might be termed implicit knowledge), and the core values and beliefs that rise to awareness by virtue of "feelings." Contexts 6 and 7 work together, with context 6 being those aspects that surface in an individual's thoughts and feelings

and context 7 being those processes occurring of which an individual is unaware, i.e., occurring in the unconscious.

Context 7 is the impact of *unconscious processes*. These can be thought of in terms of (1) the unconscious response to external stimuli (environment); (2) experiences and feelings (memories) not in conscious awareness; and (3) empathetic processes that can mirror behavior. As you will recall from our previous discussion, the selection, interpretation and meaning of incoming patterns are very much a function of pre-existing patterns in the brain (Bennet and Bennet, 2006).

Context 8 is the *overarching pattern context*, higher levels of patterns of significance that emerge in the mind. These include: (1) the unconscious—and sometimes conscious—connecting of contexts 1 through 7 to develop a pattern of understanding or behavior; and (2) the development and recognition of patterns of patterns among different interactions (over time). The connecting of multiple contexts would include comparing, manipulating and combining patterns. As noted above, the development and recognition of higher-level patterns among multiple and different interactions occurs over time. While this generally forms in the conscious mind as a feeling or sense of knowing (intuition), it may also be accompanied by a mental remembering of an emotional response from previous interactions.

These contexts are present and influential to various degrees depending on the specific social situation. Their influence on knowledge sharing may be through the participant's unconscious, but they are there. The higher the number of related (relevant) patterns (the greater the context), the greater the resonance between the source and receiver and the increased sharing of understanding. See Bennet and Bennet (2007b, 2008a) for an in-depth treatment on context. Cozolino (2002) says that along with language, significant social relationships stimulate learning and knowledge creation and shape the brain. He offers that the

two powerful processes of social interaction and affective attunement, when involving a trusted other, contribute to “both the evolution and sculpting of the brain ... [since they] stimulate the brain to grow, organize and integrate” (Cozolino, 2002, p. 213).

Following a study of unconscious communications which supported the fact that people are in constant interaction with those around them (often unconsciously), Cozolino and Sprokay say that one possible implication of this finding of specific interest is the fact that “the attention of a caring, aware mentor may support the plasticity that leads to better, more meaningful learning” (Cozolino and Sprokay, 2006, p. 13). Plasticity refers to the fact that new ideas change the patterns in the mind which changes the physiology of the brain. Also, changes in the physical brain can change the patterns of neurons and thereby thoughts of the mind. As we live, learn and change through experience, our mind/brain also changes both physically and pattern-wise. Thus the mind/brain is said to have a great deal of “plasticity.” Similarly, referring to recent discoveries in cognitive neuroscience and social cognitive neuroscience, Johnson (2006) says that educators and mentors of adults recognize “the neurological effects and importance of creating a trusting relationship, a holding environment, and an intersubjective space” (p. 68) where such things as reflection and abstract thinking can occur.

Social bonding reduces individual fears, creates trust, and makes the mind/brain much more open to incoming information and creates a desire to understand (and thereby re-create) the knowledge of the sender. In Sousa (2006) social bonding carries with it a positive, trusting relationship that allows the learner to take risks and not be concerned with mistakes made during learning. It also encourages an open mind and willingness to listen and learn from a trusted other.

Fear has been identified as an impediment to learning and knowledge sharing throughout the field of adult learning (Brookfield, 1987; Daloz,

1986, 1999; Mezirow and Associates, 1991; Perry, 1970/1988). The limbic system, the primitive part of the human brain, and in particular its amygdala, is the origin of survival and fear responses.

The literature is extensive on the need for a safe and empathic relationship to facilitate learning and knowledge sharing. Cozolino says that for complex levels of self-awareness, that is those that involve higher brain functions and potential changes in neural networks, learning cannot be accomplished when an individual feels anxious and defensive (Cozolino, 2002). Specifically, he says that a safe and empathic relationship can establish an emotional and neurobiological context that is conducive to neural reorganization. “It serves as a buffer and scaffolding within which [an adult] can better tolerate the stress required for neural reorganization” (Cozolino, 2002, p. 291). Taylor explains that,

Adults who would create (or recreate) neural networks associated with development of a more complex epistemology need emotional support for the discomfort that will also certainly be part of that process. (Taylor, 2006, p. 82).

From a neuroscience perspective, trust in a relationship enhances the sharing of knowledge, especially regarding shallow and deep knowledge. When a secure, bonding relationship in which trust has been established occurs, the learner’s neurotransmitters in the prefrontal cortex (dopamine, serotonin, and norepinephrine) are stimulated and lead to increased neuronal networking and meaningful learning (Cozolino, 2002). Schore describes this as “a cascade of biochemical processes, stimulating and enhancing the growth and connectivity of neural networks throughout the brain” (Schore, 1994, as cited in Cozolino, 2002, p. 191). Thus a caring, affirming relationship promotes neural growth and knowledge creation. Such physiological changes can quickly influence the attitude and expectations of people involved in social knowledge sharing and learning.

Without such trust and bonding, a listener tends to defend his or her own pre-established beliefs, theories, frames of reference, and self-image. Under normal situations, we tend to defend our beliefs and how we see the world. This defense may accept some incoming information, reject other, and change some. When these distortions occur, the incoming information can no longer represent the knowledge of the sender and therefore it is not shared. New knowledge that challenges or contradicts what we already know also tends to threaten our concept of Self, and thereby creates defensive reactions that minimize or negate learning. Our mind concentrates on “defending itself” and does not have time for listening or taking the other person’s view and understanding.

On the other hand, if a trusting, nurturing relationship exists between two people, a safe environment can be created that eliminates or minimizes potential threats to the learner. Daloz (1986) refers to such a situation as a holding environment (in Johnson, 2006, p. 64). When such a relationship is created, the receiver can build a new sense of Self while building the sender’s knowledge out of the information that moves from the sender to the receiver. Such knowledge may not be identical to the sender’s knowledge because the mind/ brain of each participant is different. However, when the knowledge sharing is successful, the knowledge in each person may be equally capable of taking effective action even though their understanding, meaning and insight may differ in some ways.

Andreasen cites mentoring as one of the elements that helps create a cultural environment to nurture creativity. From a broader perspective, the five circumstances that create what she calls a “cradle of creativity” include an atmosphere of intellectual freedom and excitement; a critical mass of creative minds; free and fair competition, mentors, and patrons, and at least some economic prosperity. As she concludes, “If we seek to find social and cultural environmental factors that help to create the creative brain, these must be

considered to be important ones” (Andreasen, 2005, p. 131).

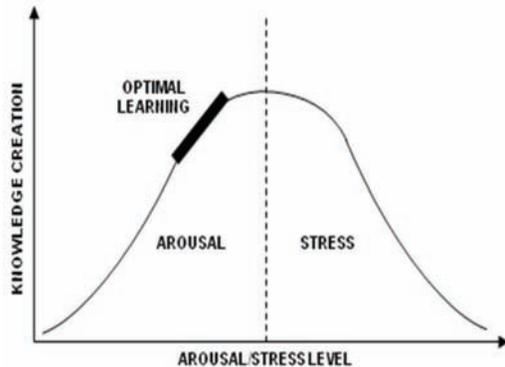
Cozolino (2002) says that the efficacy of the mentoring relationship—a balance of support and challenge—is supported by the literature on brain function. “We appear to experience optimal development and integration in a context of a balance of nurturance and optimal stress” (p. 62). Considering stress, Akil et al. state,

The stress system is an active monitoring system that constantly compares current events to past experience, interprets the relevance (salience) of the events to the survival of the organisms ability to cope. (Akil et al., 1999, p. 1146)

If the emotional content of incoming information from a conversation is one of strong fear or uncertainty to the individual, stress is created and can significantly limit any learning involved. However, if there is too little arousal/stress involved then there may be no desire for listening. Thus, for each individual there exists at any given time some optimal level of arousal/stress (Zull, 2002). Note that low levels of stress are often referred to as arousal.

Plotting knowledge creation rate on the vertical axis and arousal/stress level along the horizontal axis, we get an inverted U. See Figure 2. The optimum arousal level shown just to the left of the center of the inverted U challenges the listener but does not make them fearful of failure or embarrassment (Akil et al., 1999). This optimal level learning and knowledge creation is context sensitive and content dependent and is also influenced by the individual’s history. The learner’s personal beliefs and feelings about the content of the materials can also play a role in determining his or her stress level. To optimize learning in a given situation, individuals need to understand their own arousal/stress level that challenges them to create knowledge from what they hear, but does not reduce this capacity because of fear. It is possible for individuals to control their

Figure 2. Representation of the relationship between knowledge creation and arousal/stress



perception of stress by recognizing its existence and understanding that stress is created *inside* the body and can therefore be understood and managed (Begley, 2007).

The notion of affective attunement is connected to Dewey's observations that an educator needs to "have that sympathetic understanding of individuals as individuals which gives him an idea of what is actually going on in the minds of those who are learning" (Dewey, [1938] 1997, p. 39). As Johnson (2006) explains, "According to social cognitive neuroscience, the brain actually needs to seek out an affectively attuned other if it is to learn. Affective attunement alleviates fear," (p. 65) a significant impediment to learning. These mechanisms support learning situations by enhancing understanding, meaning, truth and how things work, and anticipating the results of actions.

One example of affective attunement that stimulates the orbitofrontal cortex is eye contact because "specific cells are particularly responsive to facial expression and eye gaze" (Schoré, 1994, p. 67). As Johnson explains, literally "looking into the eyes of the affectively attuned other is another significant form of social interaction that can assist in promoting development" (Johnson, 2006, p. 67). This reflects the earlier discussion on the importance and natures of context. Similarly, Frith and Wolpert (2003) forward that an infant

and caregiver enter into an intersubjective space. This space may be created around the infant and caregiver through the process of emotional resonance or affective attunement (Johnson, 2006).

COLLABORATIVE ENTANGLEMENT (LEARNING TO CREATE KNOWLEDGE AS COMMUNITIES)

Biological systems are remarkably smarter in their support of the body than we are in sustaining our work places and communities. Fortunately, we can and are learning from ourselves in this sense, and whether we reflect on this learning in the form of a reality or as an analogy is insignificant as long as we keep learning and creating knowledge (Bennet and Bennet, 2008).

In a social setting new thoughts and behaviors proposed through research or personal reflection (based on earlier learning) emerge and then build on other's thoughts and behaviors and then become mixed with yet another set of thoughts and behaviors from the community, and so on. We call this mixing, entwining and creation of unpredictable associations the process of *entanglement*. In other words, the knowledge creation process in a group or community works very much as does the human mind/brain.

In communities, collaborative entanglement consistently develops and supports approaches and processes that combine the sources of knowledge and the beneficiaries of that knowledge to interactively move toward a common direction such as meeting an identified community need. In addition to decision-making, collaborative entanglement includes the execution and actions that build value for all stakeholders, engaging social responsibility and providing a platform for knowledge mobilization. The collaborative entanglement model is highly participative, with permeable and porous boundaries (being continuously reshaped) between the knowledge creator—an individual, team, or community—and

knowledge beneficiary. An example is a university research program in the social sciences involving action learning (of a team, group or community), where the research itself becomes part of the process of implementing research results (Bennet and Bennet, 2007). Lee and Garvin contend that to be effective, knowledge exchange depends on multi-directional, participatory communication among all participants (Lee and Garvin, 2003). *The collaborative entanglement model moves beyond knowledge exchange to the creation of shared understanding resulting in collaborative advantage and value creation* (Bennet and Bennet, 2007b, 2008a).

Collaborative entanglement as a social phenomenon can be analogous to the natural activities of the brain, with the brain representing the researcher (in our example) and the stakeholder community representing the knowledge beneficiary. All the living and learning of the host human is recorded in the brain, stored among some hundred billion neurons that are continuously moving between firing and idling, creating and re-creating patterns. Information is coming into the individual through the senses which, assuming for the sake of our analogy, resonates with internal patterns that have strong synaptic connections. When resonance occurs, the incoming information is consistent with the individual's frame of reference and belief systems. As this incoming information is complexed (the associative patterning process) it may connect with (and to some degree may bring into conscious awareness) deep knowledge. The unconscious continues this process (24/7), with new knowledge stored in the unconscious and perhaps emerging at the conscious level.

In the collaborative entanglement model, individuals and groups are continuously interacting as new information becomes available through their sensors; for example, if (1) they recognize a problem or issue and/or solution, (2) they see new indicators that bode well or poorly for the community, or (3) new events occur that affect an on-going project or community effort. From

these interactions—often connected to strong emotional feelings which increase the importance and strength of their meaning—new knowledge emerges. When individuals or groups are engaged in this interactive, emergent process with other stakeholders, the new knowledge that emerges is *informed* by their learned expertise. As new knowledge is applied and this iterative loop of collective learning continues, a large amount of tacit knowledge (embodied, affective and intuitive) is created beyond that which visibly affects the community (Bennet and Bennet, 2008a). This new tacit knowledge then forms the grounding (best thinking) for future incoming information that will be associated with these patterns. In other words, the process of collaborative entanglement among individuals not only helps provide a specific solution to a current issue, but seeds the ground for continuous community self improvement, collaboration, and sustainability.

AN EXTRAPOLATION

With the new century emerged new ideas on every front, one of which was expansion of the global brain concept. The term originally emerged in print in 1983 with the publication of Peter Russell's book by that name. Grounding his work on historic observations of new levels of organization occurring based on the tight-but-flexible coupling of 10 billion units in a system, Russell described an interconnected network of humans as becoming a Global Brain (Russell, 1982). In 1995 Gottfried Mayer-Kress and Cathleen Barczys proposed that "a globally and tightly connected network of computer workstations such as the Internet can lead to the emergence of a globally self-organized structure that could be called the Global Brain" (Mayer-Kress and Barczys, 1995, p.1). In 2000 Howard Bloom's treatment described the network of life on Earth as a complex adaptive system. He shows how animals and plants have evolved together as components of a worldwide learning

Social Learning from the Inside Out

machine, with humans playing conscious and unconscious roles, with development of the World Wide Web as part of this learning. And so forth.

We choose to explore the concept of Global Brain from the viewpoint of the mind/brain—perhaps moving towards the higher level of evolution introduced by Pierre Teilhard de Chardin's *noosphere*, a network of thoughts ushering in a new level of consciousness. Recognizing that the mind/brain supports survival and sustainability in a complex and unpredictable world, we now consider, somewhat metaphorically, the potential of learning from the totality of ourselves to further explore the emergence of social knowledge, that is, extrapolating our model of the individual mind/brain to a societal level. Perhaps the simplest way to achieve this extrapolation is through story form.

As SETH streamed into unknown territory, he was further excited by the feelings of familiarity and resonance emerging within. SETH represented Self-Evolved Thinking Humans, a pattern of men and women crossing cultural, ethnic, religious and gender boundaries in pursuit of ultimate knowledge. SETH's capacity to anticipate was high, honed by the association of a wide range of experiences and a highly tuned emotional guidance system. Still, with all her historic success in anticipating and dealing with the future in her area of expertise, this landscape was different ... was that a tinge of fear in her side tagging along for the ride?

SETH was responding to a strong message received from this distant realm, a message associated with survival, no doubt one of those learnings worthy of a new category of The Nobel Prize, a grand new way of thinking and being. He now stood on the high ground above that distant realm, a hundred thousand homes stretched out as far as he could see, lights twinkling through the windows and pulsing along the billion connecting three-dimensional highways, roads and paths that made the community One. Some spots were brighter than others: flitting patterns from

a movie theatre playing reruns; flashing sparks from a loudly-buzzing generator; colorful streams from an observatory at the far edge of the city sporting a large, upward-focused telescope. And near the center of this hub of activity, to the left, where connecting paths intertwined with incessant beams of entangled reds and blues and yellows, the brightest light moved in and out of the central library. SETH understood the power of record-keeping at its best, a living, vibrant field of growing and expanding patterns evolving from instant to instant.

SETH moved toward that light, carefully navigating the busyness of the intersections, pulled this way and that by the excitement, but committed to staying the course. He had come to learn from the Master, to discover that single thought that guided all the others. He paused to reflect on this singular yearning for the discovery of something more that had emerged since his first feeling of the message.

Then he arrived at his destination, startled by the peace within the hub of excitement, but gently perceiving the silence and fullness that comes with knowing. What might be described as an inner council of sorts welcomed him, each member of the council a different aspect of the One. Eager to discover answers to his questions, he moved quickly through the formalities of introductions, conveying greetings from mutual distant relatives, sharing the urgency of his mission, and expressing gratitude for a warm reception.

"The environment is rapidly changing," the leader began, "and though you journeyed quickly following the first flash, much new information is coming in from our sensors and emerging from our internal sources that is shifting our direction. Let us see how you fit, what you contribute ..."

"And what we can learn from you," SETH interrupted.

"Yes," the leader confirmed, "that is also a possibility."

"Possibility?" SETH questioned. "But this sounded like the answer we have been seeking;

finally, absolute knowledge. It resonates with our beliefs, with our preferred frames of reference, with our values ...”

“Ah,” responded the leader, “but beliefs and frames of reference and values also change. They are tools for us to act effectively in an uncertain and changing environment.”

SETH was puzzled, confused even. “No. Our community is also one hundred thousand strong, although many of those connections are outliers, at a distance, only a few reside in the center of town. Still, we have held onto those early values embedded during the beginning of time, and have picked up incoming information throughout our history that has reinforced those values, and we have sent continuous messages beyond our boundaries to guide those who are on misdirected paths ...”

“So that was you,” the leader sighed. “Those historic values were holding all of us back for awhile.” There was a short pause, accented by rhythms of soft bursts of light. The leader continued, “And yet you are here. You were able to sense something new and different with the potential of evolving our connections and firings to another level.”

“Yes ... it was magical,” responded SETH. “There was an explosion right in the center of town—at our Central Library—that coincided with the explosion here, visible and felt even across such great distances. So strong that it pulled me here. Where did it come from? What exactly is it? Give me the words, the pattern, the context, to understand and learn and connect and share.”

The leader smiled and silently moved away from SETH even as another form approached and continued the interaction. “YOU are part of the answer to your questions! It is at the core of who you are, and now you are more, for you are more strongly connected to us, and, in turn, to all those with whom we interact. We welcome your contribution.”

SETH was beginning to tire of these circular responses. “But I’m here to discover the grand new way of doing and being, the answer!”

A third form was now moving toward SETH, hand out-stretched, eyes sparkling with amusement. “There is no such thing; and simultaneously all you know is part of such a thing!”

“We are part of such a thing that does not exist!?” SETH blurted out.

The third informer gently motioned to the shelves and shelves of books and movies surrounding them in a hazy glow. “We store here only a small amount of what we observe, what we reflect, what we discover, and it is always reforming and reconnecting in new ways to create the wonderful flash which brought you here.” She gestured a full circle, gliding around with the gesture. “Perhaps you had forgotten? This is the process of birth and regeneration, the way of knowledge, the capacity to take effective action, a human gift to navigate the rapids of change, uncertainty and complexity.”

“I don’t understand,” SETH sorrowed. “How can I anticipate those rapids?”

“You started that journey already” came the slow response. “You are here with us, interacting, each of us learning from the other. Our thoughts are no longer distant to you. The third informer paused, pulsing with soft light that reached toward SETH.”

My friend, our future is neither predetermined nor knowable. It rests with the dynamics, uncertainty and complexity of an almost infinite number of quasi-independent biological thinking subsystems that are continuously and deeply interconnected, with each trying to comprehend the whole but acting to the benefit of the individual. There is no “answer” or ultimate action, there is learning, thinking and recognizing (and acting) the role of each biological subsystem which, in turn, affects the learning, thinking and acting of the whole in completely unpredictable ways. Patterns in a never-ending journey in which SETH was fully participating. As SETH turned her energy towards home, she reflected on re-connecting

with her trusted network, sharing new patterns, expanding their thoughts through exchange and dialogue, and re-creating themselves (continuously) to co-evolve with a changing universe ...

FINAL THOUGHTS

Experiential learning is not just a function of the incoming information. It becomes clear that the nature of the social interaction plays an important role in determining knowledge creation and sharing. The overall environment, a trusted other, and the conscious and unconscious state of the learner all have a role in the final efficiency and effectiveness of learning that occurs. Further, the specific social interaction that influences the neural structure, and the perceived stress level of the individual, will affect the nature and amount of knowledge that is created and shared. By being aware of these factors, learners may be able to change the local physical environment, improve communication with others, or perhaps position and adjust their own internal feelings and perspectives to maximize learning.

Here are a few summary highlights of this paper in terms of recent neuroscience findings:

There is an optimum level of stress for learning (the inverted “U”). This level is somewhere between a positive attitude and a strong motivation to learn (arousal), and some level of fear of learning or the learning situation.

Physical mechanisms have developed in our brain to enable us to learn through social interactions. These mechanisms support affective attunement, help us consider the intentions of others and what others are thinking, and help us think about how we want to interact (Johnson, 2006).

The brain actually needs to seek out an affectively attuned other for learning. As Johnson explains, effective attunement reduces fear, and creates a positive environment and motivation to learn (Johnson, 2006).

Physical and mental exercise and social bonding are significant sources of stimulation of the brain. Studies in social neuroscience have affirmed that over the course of evolution physical mechanisms have developed in our brains to enable us to learn through social interactions (Amen, 2005).

Language and social relationships build and shape the brain. This significantly impacts the sensing aspect of concrete experience and the concepts, ideas, and logic of abstract conceptualization. Good social relationships enhance learning through a reduction of stress, a shared language, and the use and understanding of concepts, metaphors, anecdotes, and stories.

Adults developing complex neural patterns need emotional support to offset discomfort of this process. Taylor (2006) suggests that this support is needed by individuals developing complex knowledge. Such emotional support will enhance the feelings of an individual during concrete experience, and also aid in the creation and understanding of concepts and ideas during abstract conceptualization.

Effective attunement contributes to the evolution and sculpting of the brain. Effective attunement involves a mentor, coach, or another significant individual who is trusted and capable of resonance with the learner. When this happens, a dialogue with such an individual can greatly help the learner in understanding, developing meaning, anticipating the future with respect to actions, and receiving sensory feedback. As these new patterns are created in the mind, they in turn impact and change the structure of the brain.

An enriched environment increases the formation and survival of new neurons. Such an enriched environment can influence both the nature of the experience of the learner and his or her learning efficacy. As Begley (2007) describes, “exposure to an enriched environment leads to a striking increase in new neurons, along with a substantial improvement in behavioral performance” (p. 58).

Collaborative entanglement represents the continuous interaction, movement of information, and sharing and learning of knowledge resulting in a community movement toward a higher level of awareness, understanding and meaning. Such a process builds both explicit and implicit knowledge and creates a learning, trust and bonding that may energize and accelerate community progress.

While we have addressed information, knowledge, learning and the factors and conditions which influence the social creation and/or sharing of knowledge, it must not be forgotten that every individual learns (creates their own knowledge) from a baseline of past experiences, theories, biases, motivations and perceptions of their Self.¹ It is concepts and their associated internal patterns that can be mixed with incoming information. Thus we can only create new knowledge from our personal autobiography, and the information coming to us in the future will be complexed with what we are learning today. Then again, our personal autobiography is rich with social interactions, social bonding experiences, and reflection—a richness to which we contribute every day of our lives.

REFERENCES

- Akil, H., Campeau, S., Cullinan, W., Lechan, R., Toni, R., Watson, S., & Moore, R. (1999). Neuroendocrine system I: Overview—thyroid and adrenal axis. In Zigmond, M., Bloom, F., Landis, S., Roberts, J., & Squire, L. (Eds.), *Fundamentals of neuroscience* (pp. 1127–1150). New York: Academic Press.
- Amen, D. G. (2005). *Making a good brain great*. New York: Harmony Books.
- Anderson, J. R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Andreasen, N. C. (2005). *The creating brain: The neuroscience of genius*. New York: The Dana Foundation.
- Ascoli, G. A. (Ed.). (2002). *Computational neuroanatomy: Principles and methods*. Totowa, NJ: Humana Press. doi:10.1385/1592592759
- Bear, M. F., Connors, B. W., & Paradiso, M. A. (2001). *Neuroscience: Exploring the brain* (2nd ed.). Baltimore, MD: Lippincott Williams & Wilkins.
- Begley, S. (2007). *Train your mind change your brain: How a new science reveals our extraordinary potential to transform ourselves*. New York: Ballantine Books.
- Bennet, A., & Bennet, D. (2004). *Organizational survival in the new world: The intelligent complex adaptive system*. Burlington, MA: Elsevier.
- Bennet, A., & Bennet, D. (2006a). Learning as associative patterning. *Vine*, 36(4), 371–376. doi:10.1108/03055720610716638
- Bennet, A., & Bennet, D. (2006b). Hierarchy as a learning platform. *Vine*, 36(3), 255–260. doi:10.1108/03055720610703515
- Bennet, A., & Bennet, D. (2007a). CONTEXT: The shared knowledge enigma. *Vine*, 37(1), 27–40. doi:10.1108/03055720710742007
- Bennet, A., & Bennet, D. (2007b). *Knowledge mobilization in the social sciences and humanities: Moving from research to action*. Frost, WV: MQIPress.
- Bennet, A., & Bennet, D. (2008a). The fallacy of knowledge reuse. *Journal of Knowledge Management*, 12(5), 21–33. doi:10.1108/13673270810902911
- Bennet, A., & Bennet, D. (2009). Managing self in troubled times: Banking on self-efficacy. In *Effective Executive* (pp. 56–82). India: The Icfai University Press, India.

Social Learning from the Inside Out

- Bennet, D. (2006). Expanding the knowledge paradigm. *Vine*, 36(2), 175–181. doi:10.1108/03055720610682979
- Bennet, D., & Bennet, A. (2008b). Engaging tacit knowledge in support of organizational learning. *Vine*, 38(1), 72–94. doi:10.1108/03055720810870905
- Bennet, D., & Bennet, A. (2008c). Associative patterning: The unconscious life of an organization. In Girard, J. P. (Ed.), *Building organizational memory*. Hershey, PA: IGI Global.
- Blakemore, S., & Frith, Y. (2005). *The learning brain: Lessons for education*. Malden, MA: Blackwell.
- Bloom, H. (2000). *Global brain: The evolution of mass mind from the big bang to the 21st century*. New York: John Wiley & Sons.
- Bownds, M. D. (1999). *The biology of mind: Origins and structures of mind, brain, and consciousness*. Bethesda, MD: Fitzgerald Science Press.
- Brookfield, S. D. (1987). *Developing critical thinkers*. San Francisco, CA: Jossey-Bass.
- Buzsaki, G. (2006). *Rhythms of the brain*. New York: Oxford University Press. doi:10.1093/acprof:oso/9780195301069.001.0001
- Byrnes, J. P. (2001). *Minds, brains, and learning: Understanding the psychological and educational relevance of neuroscientific research*. New York: The Guilford Press.
- Chickering, A. W., Dalton, J. C., & Stamm, L. (2005). *Encouraging authenticity & spirituality in higher education*. San Francisco, CA: Jossey-Bass.
- Church, D. (2006). *The genie in your genes: Epigenetic medicine and the new biology of intention*. Santa Rosa, CA: Elite Books.
- Cozolino, L., & Sprokay, S. (2006). Neuroscience and adult learning. In Johnson, S., & Taylor, T. (Eds.), *The neuroscience of adult learning*. San Francisco, CA: Jossey-Bass.
- Cozolino, L. J. (2002). *The neuroscience of psychotherapy: Building and rebuilding the human brain*. New York: Norton.
- Cozolino, L. J. (2006). *The neuroscience of human relationships: Attachment and the developing social brain*. New York: W.W. Norton.
- Daloz, L. (1986). *Effective teaching and mentoring*. San Francisco, CA: Jossey-Bass.
- Daloz, L. (1999). *Mentor: Guiding the journey of adult learners*. San Francisco, CA: Jossey-Bass.
- Damasio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt Brace & Company.
- Damasio, A. R. (2007). How the brain creates the mind. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain* (pp. 58–67). New York: Dana Press.
- Dewey, J. (1997). *Experience and education*. New York: Simon & Schuster. (Original work published 1938)
- Dobbs, D. (2007). Turning off depression. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: Dana Press.
- Edelman, G. M. (2000). *A universe of consciousness: How matter becomes imagination*. New York: Basic Books.
- Frith, C., & Wolpert, D. (2003). *The neuroscience of social interaction: Decoding, imitating, and influencing the actions of others*. New York: Oxford University Press.
- George, M. S. (2007). Stimulating the brain. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: The Dana Foundation.
- Goldberg, E. (2005). *The wisdom paradox: How your mind can grow stronger as your brain grows older*. New York: Penguin Group.

- Hawkins, J. with Blakeslee, S. (2004). *On intelligence: How a new understanding of the brain will lead to the creation of truly intelligent machines*. New York: Henry Holt & Company.
- Hyman, S. E. (2007). Diagnosing disorders. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: Dana Press.
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Johnson, S. (2006). The neuroscience of the mentor-learner relationship. In Johnson, S., & Taylor, K. (Eds.), *The neuroscience of adult learning: New directions for adult and continuing education*. San Francisco, CA: Jossey-Bass.
- Johnson, S., & Taylor, K. (2006). *The neuroscience of adult learning: New directions for adult and continuing education*. San Francisco, CA: Jossey-Bass.
- Kandel, E. R. (2006). *In search of memory: The emergence of a new science of mind*. New York: W.W. Norton & Company.
- Kuntz, P. G. (1968). *The concept of order*. Seattle, WA: University of Washington Press.
- Kurzweil, R. (2005). *The singularity is near: When humans transcend biology*. New York: Viking.
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Touchstone.
- Llinas, R. R. (2001). *I of the vortex: From neurons to self*. Cambridge, MA: The MIT Press.
- Marton, F., & Booth, S. (1997). *Learning and awareness*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Mayer-Kress, G., & Barczys, C. (1995). The Global Brain as an Emergent Structure from the Worldwide Computing Network, and its Implications for Modeling. *The Information Society*, 11(1), 1–28. doi:10.1080/01972243.1995.9960177
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, CA: Jossey-Bass.
- Moon, J. A. (2004). *A handbook of reflective and experiential learning: Theory and practice*. New York: Routledge Falmer.
- National Research Council. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Nicolelis, M. A. L., & Chapin, J. K. (2007). Controlling robots with the mind. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: Dana Press.
- Oakes, J., & Lipton, M. (1999). *Teaching to change the world*. Boston, MA: McGraw Hill College.
- Perry, W. G. (1970/1988). *Forms of ethical and intellectual development in the college years*. San Francisco, CA: Jossey-Bass.
- Pert, C. B. (1997). *Molecules of emotion: A science behind mind-body medicine*. New York: Touchstone.
- Ratey, J. J. (2001). *A user's guide to the brain: Perceptions, attention, and the four theaters of the brain*. New York: Pantheon Books.
- Rose, S. (2005). *The future of the brain: The promise and perils of tomorrow's neuroscience*. New York: Oxford University Press.
- Ross, P. E. (2006). The expert mind. *Scientific American*, (August): 64–71. doi:10.1038/scientificamerican0806-64
- Russell, P. (1982). *The awakening earth: The global brain*. London: Routledge & Kegan Paul.

Social Learning from the Inside Out

Ryle, G. (1949). *The concept of mind*. London: Hutchinson.

Schore, A. N. (1994). *Affect regulation and the origin of the self: The neurobiology of emotional development*. Hillsdale, NJ: Erlbaum.

Schore, A. N. (2002). Dysregulation of the right brain: A fundamental mechanism of traumatic attachment and the psychopathogenesis of post-traumatic stress disorder. *The Australian and New Zealand Journal of Psychiatry*, 36, 9–30. doi:10.1046/j.1440-1614.2002.00996.x

Siegel, D. J. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being*. New York: W. W. Norton & Company.

Skoyles, J. R., & Sagan, D. (2002). *Up from dragons: The evolution of human intelligence*. New York: McGraw-Hill.

Sousa, D. A. (2006). *How the brain learns*. Thousand Oaks, CA: Corwin Press.

Stern, D. N. (2004). *The present moment in psychotherapy and everyday life*. New York: Norton.

Stonier, T. (1990). *Information and the internal structure of the universe: An introduction into information physics*. New York: Springer-Verlag.

Stonier, T. (1997). *Information and meaning: An evolutionary perspective*. New York: Springer.

Tallis, F. (2002). *Hidden minds: A history of the unconscious*. New York: Arcade.

Ward, J. (2006). *The student's guide to cognitive neuroscience*. New York: Psychology Press.

Zull, J. E. (2002). *The art of changing the brain: Enriching the practice of teaching by exploring the biology of learning*. Sterling, VA: Stylus.¹ See Bennet and Bennet (2009) for a discussion of Self in a CUCA environment, that is, increasing Change, Uncertainty, Complexity, and Anxiety.

ENDNOTE

See Bennet and Bennet (2009) for a discussion of Self in a CUCA environment, that is, increasing Change, Uncertainty, Complexity, and Anxiety.

Chapter 2

Measuring the Impact of Social Media: Connection, Communication and Collaboration

Kimiz Dalkir
McGill University, Canada

ABSTRACT

This chapter focuses on a method, social network analysis (SNA) that can be used to assess the quantity and quality of connection, communication and collaboration mediated by social tools in an organization. An organization, in the Canadian public sector, is used as a real-life case study to illustrate how SNA can be used in a pre-test/post-test evaluation design to conduct a comparative assessment of methods that can be used before, during and after the implementation of organizational change in work processes. The same evaluation method can be used to assess the impact of introducing new social media such as wikis, expertise locator systems, blogs, Twitter and so on. In other words, while traditional pre-test/post-test designs can be easily applied to social media, the social media tools themselves can be added to the assessment toolkit. Social network analysis in particular is a good candidate to analyze the connections between people and content as well as people with other people.

SOCIAL MEDIA IN ORGANIZATIONS

Knowledge management researchers have been unified in voicing the notion that the sharing of information and knowledge is critical in all organizations (Nonaka and Takeuchi, 1995, Ruggles, 1998, Davenport and Prusak, 1998). Robert Buckman, of Buckman Labs, an early pioneer in successfully managing knowledge states that it is

the flow of information that gives rise to valuable knowledge:

This is not the story of me, but a story about our associates and what they did. We wanted to become more customer-driven as an organisation. That meant having our people effectively engaged with them and taking responsibility for satisfying their needs and expectations. To accomplish this, we needed to speed up the processes of sharing knowledge so we could serve our customers better.

DOI: 10.4018/978-1-60960-203-1.ch002

Measuring the Impact of Social Media

Our people needed answers from whoever had them, anywhere in the world. We were a multinational company that needed to become a global organisation. The whole thing was a journey, and it has invaded the fabric of our corporation. It didn't start out as knowledge management – we tried to do what we thought was best at the time to improve the speed at which we could respond to the needs of our customers. Then, something new comes along that seems better - other things fall by the wayside. We've really created a culture ... Think about metrics around the flow of information and knowledge rather than financial metrics. Knowledge will create value if it moves across the organisation¹.

Jarvenpaa and Staples define collaborative technology as:

... computer-based system used to accomplish information activities such as accessing, searching, sharing, storing and publishing information in a computer network within a person's work unit/department/organization (i.e. internal information activities) as well as external to the person's organization (i.e. external activities)... such systems encourage sharing of ideas in a free-flowing manner as well as in a form of structured repositories ...to exchange both information and knowledge (p. 130.)

Social media, then, are examples of collaborative technologies. Older or more traditional forms included listserves, intranets and email while the newer ones consist of social networking sites, Twitter and wikis.

It is important to distinguish between the most commonly used social media in general (such as blogging, twitter) and those implemented in organizations (such as wikis). The organizational lens should be used to discern social activities from more professional ones (for example, Facebook and its professional counterpart LinkedIn). Many organizations view social media as something

they should be familiar with and that they should experiment with. However, once introduced, they tend to remain and along with their introduction, a number of expectations are created. A number of organizations justify this experimentation through one of the following reasons:

1. “We need to attract the new generation to come and work at our company”
2. “We need to keep up with new technologies”
3. “We must need it!?”

The next question tends to be: “What is it exactly?” There is a pressing need to demystify new social media and this needs to be done on at least two major axes: the technological axis (what are the tools, how do they work, what are they used for) and the human axis (the “engine” or the “intelligence” lies not in the tools but in the people who use them to network together). The latter notion, often referred to as “collective intelligence” (Brown and Lauder, 2000) to distinguish it from individual intelligence, also need to be clearly defined and distinguished from similar concepts such as synergy and team work.

In the early to mid-nineties, a number of researchers proposed a new perspective on understanding firms as social organizations (Kogut & Zander, 1992, 1993, 1995, 1996; Zander & Kogut, 1995) and several other authors (Boisot, 1995; Conner & Prahalad, 1996; Loasby, 1991; Nonaka & Takeuchi, 1995; Spender, 1996) rather than an institution that could be understood solely in terms of market conditions, costs and transactions. Kogut and Zander (1996) proposed “that a firm be understood as a social community specializing in the speed and efficiency in the creation and transfer of knowledge” (p.503). This perspective on the theory of the firm situates social media firmly at the centre of the knowledge flows that give rise to all three forms of intellectual capital, or value, forming the organization's knowledge assets. The three types of intellectual capital are: human capital, organizational capital and social capital.

The notion of social capital has been used as a counterpoint to human and organizational capital, referred to as the Skandia model of intellectual capital (Edvinsson, 1997). Human capital is the knowledge, experience and skill set of employees while organizational capital refers to assets that are “owned” by the company such as physical inventory but also intangibles such as reputation and customer loyalty. Social capital then is the value created by the social relationships formed by the employees – the worth of the network – whether it be to innovate, to solve problems faster or to lessen the turnover rate (Nahapiet and Ghoshal, 1998). The authors further refine their definition of social capital as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social units” (p. 243). Social capital includes both the social networks in an organization as noted by Bourdieu (1986) and the assets that may be mobilized through that network, as Burt (1992) observes. Coleman (1988) showed that social relationships within the organization and wider community are an important factor in the development of human capital. Nahapiet and Ghoshal added evidence that social relationships (i.e. social capital) have an important influence on the development of intellectual capital.

Finally, as Maddock and Viton (2009) state: “But not only do you need to add social media but also commit to using them. Just experimenting with the idea is unlikely to produce any significant impact.” Organizations need to be clear on what objective(s) social media are targeting and just like any other innovation or initiative, they need to be able to track progress and assess how well the objective was met. As social media shift the paradigm from a broadcast mode to a many-to-many connection, we will need new metrics to measure not only whether or not the correct links were made (connection), whether or not the correct message was received (communication) but whether or not the online relationships formed in an organization

lead to greater efficiency and effectiveness in achieving successful outcomes (collaboration)². Collaboration as an organizational goal needs to be defined again, at a finer level of granularity. For example, in the case study organization, the goal was to increase collaboration in conjunction with organizational change to create new information and knowledge sharing pathways. One of the best ways to evaluate whether or not this has occurred is to conduct a pre, during and post change social network analysis to identify and analyze changes in patterns of interaction (Anklam, 2002).

A CONCEPTUAL OR THEORETICAL FRAMEWORK FOR SOCIAL MEDIA

Constant et al (1994) formulated an information sharing theory that describes the factors that support or constrain information sharing in technologically advanced organizations. The researchers found that both self-interest as well as the organizational culture influenced information sharing. The more the person believes that information sharing is the correct, socially expected behavior, the more they are willing to share. The more user-friendly the computer systems, the more willing users are to use them to share. And, the more a person’s work is dependent on the work of others, than the more likely the person is to share in order to increase reciprocity and in the needs of self-interest.

Jarvenpaa and Staples (2000) found that task characteristics, perceived information usefulness and the user’s level of comfort with computers were strongly associated with their use of social or collaborative media. The authors also found that the propensity to share was linked with a more structured information culture. This implies that the more structured the information flow process, the more people will share information, likely due to a need to have reliable access to credible information and knowledge possessed by other individuals. A fully organic or open culture may

Measuring the Impact of Social Media

in fact be counterproductive to knowledge sharing for professional tasks.

Cross et al (2004) found that

...found SNA uniquely effective in:

- *promoting effective collaboration within a strategically important group;*
- *supporting critical junctures in networks that cross functional, hierarchical, or geographic boundaries; and*
- *ensuring integration within groups following strategic restructuring initiatives (p. 28)*

A useful framework is to categorize the major types of social media with respect to the type of interactions they allow. Social media form one type of organizational tools that facilitate information exchange, knowledge sharing, connections, communications and collaboration between organizational members. Table1 illustrates the major categories together with examples of each type of organizational medium.

The one-to-one communication mode that is generally preferred is face-to-face. When such point-to-point communication is technologically mediated, then participants would ideally want the maximum amount of media richness and

Table 1. Major categories of organizational media

	One	Many
One to:	<ul style="list-style-type: none"> • Email • Telephone • Fax • IM, chat 	<ul style="list-style-type: none"> • Email with cc's • Listserve • YouTube video • Blog • Web page posting
Many to:	<ul style="list-style-type: none"> • Email responses • Survey tools (e.g. SurveyMonkey) • Online polls • Document markups 	<ul style="list-style-type: none"> • Wiki's • Collaborative authoring tools • Facebook • LinkedIn • Flickr • Google Docs • Community of practice

social presence (Dalkir, 2007) which serve to provide a wide bandwidth (e.g. multimedia) and give the impression that one is speaking to another individual (e.g. can hear or see cues, sense if the person is bored, interested etc.). The one-to-many category is the broadcast mode which is typified by posting messages or emails for all to see and respond to. There are also tools to facilitate the gathering of responses from many individuals that can then be received, aggregated or otherwise analyzed by one individual (such as online polls, surveys, or sending out a document for comments from multiple individuals). Finally, social media comprise the fourth category of many-to-many communications.

MEASURING THE IMPACT OF SOCIAL MEDIA

A useful approach to measuring the impact of social media, in ROI terms, is that of action research. Traditional research approaches advocate adopting the stance of a non-biased, non-observed researcher studying subjects within a controlled environment. Given the innate complexity of both organizations and the knowledge workers who are working within them, the traditional stance appears too limited to study the impact of new connection, communication and collaboration media. The notion of:

an objective observer, a sense-making observer and a critical observer, may at times be a valid perspective in its own right, each misses an essential point, namely that communication and mediated communication inherently involves an interactive process.

As a result, the observer stance leads to a disjunction between theory and action. A disjunction between theory and action renders each tradition more intent on theory building and less open to

seeing the ultimate poverty of its approach. Theories built are theories defended (p. 4).

Hearn and Foth (2004) argue that action research deserves a firm place within the family of methodologies relevant to media and communication research, though it has rarely been deployed in these fields. The authors note that:

The imperative of an action research project is not only to understand the problem, but also to provoke change ...researchers immerse themselves with the subjects under investigation in order to connect with them and encourage them to directly participate in the project as co-investigators (p. 2).

The distinction between tacit and codified knowledge is important in action research. Most research methods address codified or tangible knowledge only. Action research includes both codified and tacit knowledge. Most practitioners in fact adopt action research methods unknowingly as they tend to focus on participative development, qualitative analysis (e.g. individual interviews or focus group sessions), adaptive procedures, reflective practice, and informed action. The action research process is well suited to evaluate some aspect of a new technology or a new business practice (termed 'communicative ecologies' by Tacchi et al., 2003). Participants are often key stakeholders and they are actively involved in the project, the organizational change, and how all this fits into their organizational lives and routines. The larger social and organizational context needs to be taken into account when evaluating the impact of social media. This larger context includes the organizational culture (or unit micro-cultures), language issues, status and power, resource issues, infrastructure, policies and so forth.

Hearn and Foth (2004) note that action research means that the research process is tightly connected to the technology design or evaluation in three main ways:

1. **Active participation:** the people who should benefit from the research participate in defining the aims and direction of the research and in interpreting and drawing conclusions from it.
2. **Action-based methods:** the activities and experiences of participants generate knowledge alongside, or in combination with, more formal methods.
3. **Generating action:** research is directly aimed at generating things like medium and long-term plans, including business plans; ideas for new initiatives; solving problems; targeting sectors of the user constituency; finding new resources or partners. Action generating research can be a combination of general, wide-ranging, background research and very specific focused research (pp. 7-8).

Cummings et al (2002) found

Using the Internet to build social relationships results in social interaction that is wanting, at least when it is explicitly compared to the standards of face-to-face and telephone communication, to social relationships that are primarily conducted offline, and to traditional small groups. We do not assert that online social interaction has little value. Surveys of the general public continually reveal that most people using the Internet value email and other forms of online social interaction. Even in the age of the Web and e-commerce, online social interaction is still the most important use of the Internet [5]. However, in one-to-one comparisons, an email message is not as useful as a phone call or a face-to-face meeting for developing and sustaining social relationships. Listservs are not as valuable as small groups for establishing a sense of identity and belonging and for gaining social support. Relationships sustained primarily over the Internet are not as close as those sustained by other means (p. 108).

Ahuja (2000) found that the type of social network, such as whether it is densely cohesive or has structural holes, differed in its impact depending on the organizational context: he states that “the basic conclusion that the impact of different network attributes and positions can only be understood relative to a particular context” (pp. 450-451). This means that in the application of social networks to organizations, whether as social media to facilitate knowledge sharing and/or to assess the impact of organizational changes on the flow of knowledge, the old adage of “one size does not fit all” applies.

The context in which social media can be assessed is therefore comprised of three major components:

1. Connections – knowing who to contact in order to carry out a professional task;
2. Communications – knowing what major channels can be used to send and receive messages from people and sources from which information and knowledge can be retrieved in addition to selecting one or more of these channels;
3. Collaboration – establish mutual credibility, trust and accountability, on a mutual task or project.

The following describes the application of social network analysis to assess the impact of an organizational change intended to improve the efficiency (speed) and effectiveness (connecting the right people to the right content and to other people).

CASE STUDY OF A GOVERNMENTAL ORGANIZATION

The introduction of social media tools has been slow in the Canadian public sector. In fact, some “older” generation technologies, such as instant messaging, are banned outright (security reasons

are cited). The consultation of Facebook and other social networking sites are also frowned upon. This situation is largely due to a lack of understanding of the different social media and their potential role in organizations. The first half of the term “social media” – namely, “social” – leads to a misunderstanding that lumps all such technologies into the “not for serious work” category. Although numerous case studies exist, including the CIA’s use of Facebook (Bruce, 2007), the large majority of government departments remain staunchly unconvinced. The lack of penetration of social media into the public sector not only results in a great loss of potential productivity but also further alienates younger generations from joining this particular workforce.

There have, however, been some small forays into social media that have served to propagate good success stories. The more successful implementations are achieved, documented and publicized, the more the public sector will progress towards a cultural change that will eventually encompass a more rapid adoption of new networking tools. One such case study occurred in a large government department that had come under close scrutiny due to some negative press. All Canadian federal government departments must comply with the Access to Information Act³, which gives Canadian citizens the right to access information in federal government records. All government departments are legally mandated to respond to such requests and any perceived weakness in doing so will quickly lead to accusations of withholding information and knowledge or, being an inefficient organization and therefore one that does not optimize the use of taxpayers’ contributions.

In this particular case, the time required to find a response was found to exceed three weeks and the number of correct responses (or the success rate of answering the queries) was less than 50%. The department was determined to be more timely, accurate and professional in their provision of information to Canadian citizens. Ideally, they

wanted to be more proactive and therefore better prepared at all times rather than reacting to each query as a separate event.

One of the objectives of the senior managers in this department was to learn from each query and to document what occurred in finding each and every response. An analysis was conducted to follow the thread of the query to the end of the response cycle. Everyone involved in the information search and exchange process was asked to keep a record of who they contacted for what type of information, how frequently they interacted with them, how successful each interaction was and the media they used to exchange information. A checklist was provided to each participant to help them note what occurred in all the information exchanges and knowledge sharing interactions. A sample is shown in Table 2.

In addition to the checklist data, it was helpful to have a few follow up interviews – both individually and with small groups of individuals involved in processing Access to Information requests. Typical questions asked at these sessions included:

1. How useful was the information you receive from each colleague in helping to get your work done?

2. Who do you typically seek work-related information from? Why? (Based on past history of receiving useful information, personality, availability, quality of information?)
3. Who do you typically give work-related information to? What are some of your motivations? (Do you feel you have no choice? Reciprocity?)
4. How effective is each person listed below in helping you to think through new or challenging problems at work?
5. How well do you understand this person’s knowledge and skills?
6. Do you know who to ask what type of question?

The checklist data provides the needed level of detail and volume of data while the follow-up interviews allow the data to be better understood.

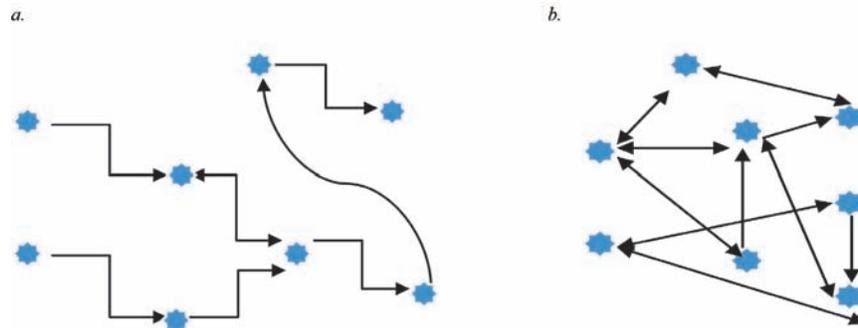
The media and interaction analysis was done before any changes were carried out to improve the situation, in order to attain a good portrait of the existing knowledge flows. The checklist was used instead of a questionnaire in order to obtain more accurate data over a longer period of time. The data collected was then used to develop a social network to visually depict who interacted with whom, using which tools and so forth. This analysis quickly showed that some people actively

Table 2. Sample checklist to obtain data on knowledge sharing

Communication channel	Interaction with:	When? How frequently?	Reason why	Outcome (successful? What did you receive?)	Please comment on why you chose this means
Telephone					
Fax					
Face-to-face					
Email					
MSN, Skype					
Discussion forum/listserv					
Community of Practice					
Other – please specify					

Measuring the Impact of Social Media

Figure 1. a. Before: Highly sequential knowledge flow; b. After: Highly networked knowledge flow



avoided interacting with one another (due to personality issues) and that there was more “fence building than bridge building” among the community of employees required to answer access to information requests. The social network analysis technique was a quick and fairly straightforward way to show the flow of information between people and knowledge sources. Presenting such a diagram—even without “naming names”—showed everyone involved where the bottlenecks were. Each person involved in the requests that were analyzed over a three-month period completed the checklists as best they could. The social network results allowed each person to better understand their role and how what they did impacted others and ultimately, the outcome of the request.

A number of team building sessions and brainstorming sessions were then held in order to help the team standardize what they needed to do. The employees also used these sessions to share and better encapsulate their knowledge and what they have learned from doing past responses to queries. In this way, an organizational learning cycle was established. Participants were encouraged to contribute their worst war stories – what was the hardest request they ever had to deal with. Next the facilitator asked participants to describe a request so routine they could almost find the response with their eyes closed. The final question was to ask participants what criteria served to distinguish the routine from the very difficult

requests. These sessions helped everyone involved better understand who was in the loop and how the loop functioned. They could then see where improvements could be made.

Figures 1a and 1b show a schematized version of the “before” and “after” social network diagrams.

The social network analysis was employed as a pretest-posttest type of evaluation tool, in order to assess the impact an organizational change can have on the flow of knowledge, the choice of media to exchange that knowledge and to at least correlate this with an improvement in efficiency, time-on-task and success of the outcomes. The term correlation is used instead of the stronger term causality due to the complex nature of organizational settings. Although the organization was fairly stable during the time of the study (i.e. there were no major changes such as downsizing, retirements, other turnover in the team, changes in mandate, changes in morale and so forth), it is very difficult to control for all possible variables in such a setting.

The same checklist was used to assess the post-change environment. The key differences were decreased individual-to-individual chains of information and knowledge exchange (e.g. face-to-face meetings, email to one person and telephone calls) in favor of a “broadcast to the whole team” approach. The community of practice in particular greatly increased in frequency

of usage and quickly became the preferred social medium for all employees. Instead of emailing, they posted updates, pooled their knowledge resources and asked for help on the community of practice shared space (on their intranet). The response time to information access requests was greatly improved (an average of six days instead of three weeks to respond) and the number of complaints decreased by 30%.

This case study is used to illustrate the potential offered by social networking analysis to evaluate the impact that an organizational change can have on the communication, collaboration and connection patterns of employees affected by the change. For example, a training session or the introduction of new communication medium such as Twitter or a wiki may be the target and the pretest-posttest model can be used as part of the business case for using such social media in the workplace.

DISCUSSION

As Bourdieu (1986) observes, "...the existence of connections is not a natural given, or even a social given. .. it is the product of an endless effort at institution" (p. 249). The case study illustrates this point strongly – the sharing and flow of knowledge must be designed, facilitated and assessed in order to continually optimize the contribution of network members to an organizational goal – in this case, timely and accurate responses to citizen enquiries. The role of social media in such networks is – at a minimum – twofold: both as technological facilitators of many-to-many knowledge sharing and as an assessment tool and methodology to evaluate the efficiency and effectiveness of knowledge sharing.

Cross et al (2004) note that

Social network analysis provides a means with which to identify and assess the health of strategically important networks within an organization.

By making visible these otherwise "invisible" patterns of interaction, it becomes possible to work with important groups to facilitate effective collaboration ...they can re-focus executive attention on how organizational design decisions and leadership behaviors affect the relationships and information flows that are at the heart of how work is done... with social network analysis, managers have a means of assessing the effects of decisions on the social fabric of the organization (p. 17).

Social media can be quite effectively assessed with respect to their impact and the benefits they bring to improving connecting, communicating and collaborating within organizations. The use of action research methods together with social network analysis provides a powerful toolkit for investigating what happens when a new communication medium, a new technology or a change in work process is introduced. The proposed evaluation framework is thus easily extended to evaluate not only social media but any organizational change, from a social networking lens.

ANNOTATED BIBLIOGRAPHY ON SOCIAL NETWORK ANALYSIS

An excellent annotated bibliography has been compiled by Patti Anklam and Bruce Hoppe. The references are grouped into the following themes:

1. Social and personal networks in organizations
2. Communities of practice
3. Networks, business and knowledge management
4. Organizational networks research
5. The science of networks
6. SNA textbooks
7. Brief readings and articles
8. Websites and blogs.

Refer to: Annotated bibliography of social network analysis for business. Connectedness. May

5, 2005. Available online at: <http://connectedness.blogspot.com/2005/05/annotated-bibliography-of-social.html>.

REFERENCES

Ahuja, G. (2000). Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study. *Administrative Science Quarterly*, 45(3), 425–455. doi:10.2307/2667105

Anklam, P. (2002). Knowledge management: the collaboration thread. [ASIST]. *Bulletin of the American Society for Information Science and Technology*, 28(6). Retrieved from http://www.providersedge.com/docs/km_articles/KM_-_The_Collaboration_Thread.pdf.

Boisot, M. (1995). *Information space: A framework for learning in organizations, institutions and culture*. London: Routledge.

Bourdieu, P. (1986). The forms of capital. In Richardson, J. (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). New York: Greenwood.

Brown, P., & Lauder, H. (2000). Human capital, social capital and collective intelligence. In Brown, S., Field, J., & Schuller, T. (Eds.), *Social capital: Critical perspectives* (pp. 226–242). Oxford University Press.

Bruce, C. (2007). CIA gets in your Face(book). *Wired*. Retrieved from <http://www.wired.com/techbiz/it/news/2007/01/72545>

Burt, R. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.

Connor, K., & Prahalad, C. (1996). A resource-based theory of the firm: knowledge versus opportunism. *Organization Science*, 7, 477–501. doi:10.1287/orsc.7.5.477

Constant, D., Keisler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitudes about information sharing. *Information Systems Research*, 5(4), 400–421. doi:10.1287/isre.5.4.400

Cross, R., Borgatti, S., & Parker, A. (2004). Making invisible work visible: using social network analysis to support strategic collaboration. *California Management Review*, 44(2), 25–46.

Cummings, J., Butler, B., & Kraut, R. (2002). The quality of online social relationships. *Communications of the ACM*, 45(7), 103–108. doi:10.1145/514236.514242

Dalkir, K. (2007). Characterization of knowledge sharing channels on the Internet. In Bolisani, E. (Ed.), *Building the Knowledge Society on the Internet: Making Value from Information Exchange* (pp. 89–119). Idea Publishing Group.

Davenport, T., & Prusak, L. (1998). *Working knowledge*. Boston, MA: Harvard Business School Press.

Edvinsson, L. (1997). Developing intellectual capital at Skandia. *Journal of Long Range Planning*, 30(3), 320–321, 366–373.

Hearn, G., & Foth, M. (2005). Action research in the design of new media and ICT systems. In Kwansah-Aidoo, K. (Ed.), *Current Issues in Communication and Media Research* (pp. 79–94). New York: Nova Science.

Jarvenpaa, S., & Staples, D. (2000). The use of collaborative electronic media for information sharing: an exploratory study of determinants. *The Journal of Strategic Information Systems*, 9, 129–154. doi:10.1016/S0963-8687(00)00042-1

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities and the replication of technology. *Organization Science*, 3, 383–397. doi:10.1287/orsc.3.3.383

Kogut, B., & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies*, 24, 625–645. doi:10.1057/palgrave.jibs.8490248

Kogut, B., & Zander, U. (1995). Knowledge, market failure and the multinational enterprise: A reply. *Journal of International Business Studies*, 26, 417–426. doi:10.1057/palgrave.jibs.8490182

Kogut, B., & Zander, U. (1996). What do firms do? Coordination, identity and learning. *Organization Science*, 7, 502–518. doi:10.1287/orsc.7.5.502

Kwansah-Aidoo, K. (Ed.). (2005). *Current Issues in Communications and Media Research*. New York: Nova Science.

Loasby, B. (1991). *Equilibrium and evolution: An exploration of connecting principles in economics*. Manchester, UK: Manchester University Press.

Maddock, M., & Viton, R. (2009). The smart way to tap social media. Retrieved May 31, 2009 from http://www.businessweek.com/managing/content/may2009/ca20090526_882141.htm

Moody, J., & White, D. R. (2003). Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups. *American Sociological Review*, 68(1), 103–127. doi:10.2307/3088904

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, 23(2), 242–266. doi:10.2307/259373

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company. How Japanese companies create the dynamics of innovation*. Oxford, UK: Oxford University Press.

Ruggles, R. (1998). The state of the notion: knowledge management in practice. *California Management Review*, 40(3), 80–89.

Solis, B. (2007). The definition of social media. WebPro News. Retrieved Oct. 1, 2009 from <http://www.webpronews.com/blogtalk/2007/06/29/the-definition-of-social-media>

Spender, J.-C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17(62), 45–62.

Tacchi, J., Slater, D., & Hearn, G. (2003). *Ethnographic Action Research: A Handbook*. New Delhi: UNESCO.

Zander, U., & Kogut, B. (1995). Knowledge and the speed of transfer and imitation of organizational capabilities: an empirical test. *Organization Science*, 6, 76–82. doi:10.1287/orsc.6.1.76

KEY TERMS AND DEFINITIONS⁴

Connection: A connection can be defined as “a person is connected with another through ... common interest; a political, social, professional or commercial relationship; a set of persons associated together. Synonyms include coherence, continuity, and clan.”

Communication: A “process by which information is exchanged between individuals through a common system of symbols, signs, or behaviour. Synonym: information exchange.”

Collaboration: “To work jointly with others or together especially in an intellectual endeavour; to cooperate with an agency or instrumentality with which one is not immediately connected; “to labour together” from the Latin.”

Explicit Knowledge: Consists of anything that can be codified, or expressed in words, numbers, and other symbols (such as plans, marketing surveys, customer lists, specifications, manuals, instructions for assembling components, scientific formulae, graphics) and can, therefore, be easily articulated, usually in the form of documents, processes, procedures, products, and practices⁵.

Human Capital: Health, knowledge, motivation, and skills, the attainment of which is regarded as an end in itself (irrespective of their income potential) because they yield fulfillment and satisfaction to the possessor. In an organizational context, human capital refers to the collective value of the organization's intellectual capital (competencies, knowledge, and skills). This capital is the organization's constantly renewable source of creativity and innovativeness (and imparts it the ability to change) but is not reflected in its financial statements. Unlike structural capital, human capital is always owned by the individuals who have it, and can 'walk out the door' unless it is recorded in a tangible form, or is incorporated in the organization's procedures and structure⁶.

Intellectual Capital: Collective knowledge (whether or not documented) of the individuals in an organization or society. This knowledge can be used to produce wealth, multiply output of physical assets, gain competitive advantage, and/or to enhance the value of other types of capital. Intellectual capital is now beginning to be classified as a true capital cost because (1) investment in (and replacement of) people is tantamount to investment in machines and plants, and (2) expenses incurred in education and training (to maintain the shelf life of intellectual assets) are equivalent to depreciation costs of physical assets. Intellectual capital includes customer capital, human capital, intellectual property, and structural capital⁷.

Social Capital: Stock of community's goodwill and trust acquired by an organization over the years, through its understanding and addressing of the concerns and priorities of the citizens. See also social value⁸.

Social Media: (1) The online tools that people use to share content, profiles, opinions, insights, experiences, perspectives and media itself, thus facilitating conversations and interaction online between groups of people. These tools include blogs, message boards, podcasts, micro blogs, livestreams, bookmarks, networks, communities, wikis, and vlogs. A few prominent examples of

social media applications are Wikipedia (reference), MySpace and Facebook (social networking), Twitter and Jaikue (presence apps), YouTube (video sharing), Second Life (virtual reality), Upcoming (Events), Digg and Reddit (news aggregation), Flickr and Zoomr (photo sharing), Blogtv, Justin.tv, and Ustream (livecasting), Stickham, YourTrumanShow (episodic online video), Izimi and Pownce (media sharing), del.icio.us (bookmarking) and World of Warcraft (online gaming); (2) The democratization of content and the understanding of the role people play in the process of not only reading and disseminating information, but also how they share and create content for others to participate. It is the shift from a broadcast mechanism to a many-to-many model, rooted in a conversational format between authors and people (Solis, 2007).

Structural Cohesion: The minimum number of members who, if removed from a group, would disconnect the group.⁹

Structural Hole: Static holes that can be strategically filled by connecting one or more links to link together other points. Linked to ideas of social capital: if you link to two people who are not linked you can control their communication¹⁰.

Tacit Knowledge: Knowledge or understanding which is stored in an individual's head or embedded within the culture of an organisation. It is not written down and therefore is difficult to share without direct contact and coaching by the individual who holds the knowledge¹¹.

ENDNOTES

¹ Great minds think differently - An interview with Robert Buckman. Association of Knowledge Work., Available at: http://kwork.org/white_papers/buckman.html.

² See definitions at the end of the chapter.

³ Treasury Board of Canada, <http://www.tbs-sct.gc.ca/atip-airp/index-eng.asp>.

- ⁴ (Merriam Webster online dictionary. Retrieved May 31, 2009 from: <http://www.merriam-webster.com/dictionary/connection>.
- ⁵ <http://www.quantum3.co.za/CI%20Glossary.htm>
- ⁶ Business dictionary: <http://www.business-dictionary.com/definition/intellectual-capital.html>.

- ⁷ Ibid.
- ⁸ Ibid.
- ⁹ Moody and White (2003)
- ¹⁰ Ibid.
- ¹¹ www.infoskills.scot.nhs.uk/courses/mod/glossary/view.php

Chapter 3

Challenging our Assumptions: Making Sense of the Sharing of Social Knowledge

Suzanne Roff-Wexler

Compass Point Consulting, USA

Loretta L. Donovan

Innovation Partners International, USA

Salvatore Rasa

im21 (innovation/measurement 21st. century), USA

ABSTRACT

This chapter explores the assumptions we make, the questions we ask, and the “social knowledge” we use to make decisions about our personal and business lives. It poses provocative questions challenging assumptions about using social media to know what we know. The three co-authors take the position of transparency to engage in a dialogue around issues that they agree are critical to any thoughtful exploration of social media: trust, assumptions, and reality. Personal experiences and anecdotes provide context for scholarly ideas and references. The chapter offers its readers a method to continue the dialogue.

“Cada cabeza es un mundo” (“Every head is a world”) – Cuban proverb

INTRODUCTION

In this chapter, we explore the assumptions we make, the questions we ask, and the “social knowledge” we use to make decisions in our personal and business lives. We pose provocative questions challenging assumptions about using social

media to know what we know. The structure of the chapter departs from the traditional in several ways. First, in the spirit of transparency we share who we are and describe our approach. Secondly, we disclose our biases in an effort to express our own authentic perspectives and voices to the topics under consideration. Finally, we do not attempt to provide a formal review of the literature, and have chosen instead to suggest the relevant research

DOI: 10.4018/978-1-60960-203-1.ch003

and points of view which inform our thinking and may illuminate the way to greater understanding.

Who We Are

Suzanne Roff-Wexler is a consulting psychologist focused on 21st technology and psychology, social media, narrative, and collective knowledge. She is co-founder and senior partner of Psychology21C -- a collaborative venture dedicated to applying new technologies, including virtual environments, to the science of human behavior. As president of Compass Point Consulting, she provides executive coaching and consulting to client organizations. She has a passion for bringing people together to have meaningful conversations, learn, collaborate, and make sense of personal and organizational life.

Loretta L. Donovan is a cutting edge, versatile contributor to organizational development and corporate learning. Her professional life includes the internal role of Corporate Director of Organizational Learning and Leadership with the Health Quest, a hospital and healthcare system, and external consulting as an associate of Innovation Partners International, and principal of the Worksmarts Group. Based on a wealth of experience as an executive, consultant, and academic, she has focused on dialogue, knowledge creation and critical action in organizational life. She is an early adopter of Web 2.0 and fosters the use of open source and social media for digital collaboration. Technology companies, professional sports teams, healthcare institutions and universities are among the places where she has helped successful transformation of vision and viewpoints, new organizational structures, and redesign of business processes.

Salvatore Rasa claims that he usually does not fit in anywhere in particular. He has a B.A. in philosophy and a M.F.A in directing. Fortunately, he has been able to work in a variety of learning, organization design and strategic communication projects for global companies, the people who live on his block in New York City, and several

of the world's wonderful arts institutions. Often, his work has involved teams experiencing radical change in over 120 countries and sometimes, it's been with a small group of dedicated professionals who understand that their own networks provide answers that should be shared. Providing, they can be heard. Sal is a founding member of im21 (*Innovation - Measurement – 21st Century*) which focuses on inclusive communication in a diverse global workplace. He is president of *generating community – driven solutions* dedicated to the notion that the ability of an organization or community to communicate is a direct reflection of the overall health of that entity.

Our Approach

When we began the process of drafting this chapter, the references that each of the co-authors assembled tended to fall along two distant poles: one abstract and statistically academic, and the other promotional and close to marketing hype. We were looking for something different – more personally expressive, collaborative; challenging not only assumptions, but the way in which much social media oriented literature now exists. We decided to position our writing within a middle zone. We conjured a place where we were transparent as co-authors and where we could dialogue around what we agree is critical to any thoughtful exploration of social media: truth, assumptions, and reality. It brought to mind a quote recently shared by a friend that came from his grandfather, “If you want to know anything, ask five biased people because there isn’t any other kind.” Well, here we are three biased people eager to dialogue about knowing what we know. Or as Socrates reminds us, “I know that I am intelligent, because I know that I know nothing.”

“Don’t Keep Secrets”

Michael is five years old. His parents work in IT. He has three BlackBerrys to play with.

Challenging our Assumptions

- Q. Michael, do you have good teachers in your school?
- A. Our teachers are very good. We do fun stuff with them.
- Q. Why are they good teachers?
- A. They do fun stuff with us and that's kind of learning.
- Q. What's an example of what they teach you?
- A. Definitely not hitting. All the kids don't always listen to the teacher.
- Q. Do you learn things from people other than your teachers?
- A. Kids learn from other kids.
- Q. Do you teach other kids?
- A. I don't teach them how to train cats.
- Q. Why do you like to train cats?
- A. I work with cats and cats are very soft and they are nice.
- Q. So you don't teach other kids about this, but how did you learn to train cats?
- A. I did not learn, I just know. I did not learn anything from anyone else.
- Q. Why do you like BlackBerrys?
- A. I like the BlackBerrys because I can send and get e-mails. (His parents say he never does either. But Michael insists he does.)
- Q. Do you know about the Internet? What do you like about it?
- A. You listen to people when they say nice things. When they don't, you don't listen. They tell you things you might not know and sometimes, they ask you things you might know. They have to be nice (on the Internet) or I would not listen to them.
- Q. What do your parents teach you?
- A. They teach me things that I do not know.
- Q. Do you like to learn things from the other kids?
- A. Not always. Because we might be having a disagreement and if there is not a teacher, that might be bad.
- Q. How can I learn things, because I don't go to school anymore?
- A. Don't keep secrets.

TRUST

We have chosen to begin our examination of social knowledge by looking at trust and its implications with Suzanne opening the dialogue. In her words:

Trust, assumptions, and reality are integral aspects of my practice as a psychologist in non-clinical and clinical settings. As I begin this conversation with my co-authors by focusing on trust, let me add that for me trust, that intangible quality, is a felt sense between me and a client. It involves many unconscious and conscious verbal and non-verbal cues, but it is so much more than "trust me." I am a licensed professional with an ethical responsibility to maintain confidentiality, to do no harm, and not to profit personally from the client relationship. Trust, in that role is a reflective self-awareness, a kind of pattern recognition, an internal state of calm, perhaps emanating from a strong sense of being "true" to oneself. But that is only one category or way to view trust. If there were a taxonomy of trust, you would see many different categories in addition to trust of self, such as trust of others, of organizations, of country, of God, or of social knowledge. I assume its presence, therefore I am alive and evidence of that principle: trust begins with self, is experienced with others, and then is further challenged by workplaces and 21st century technology.

It is almost a cliché to state that trust is the foundation of any good relationship. What interests me here is trust in the context of how social knowledge is created and used. In the essay, *On Regulating What is Known*, social epistemologist R. Buckminster Fuller (1987) suggests that "having knowledge" is ultimately a matter of credibility. What is striking is that his ideas have much significance for a Web 2.0 world that did not exist when he wrote them. Fuller argues that given the numerous ways people can draw on each other's work, centers of credibility in the knowledge production process do not necessarily imply a convergence of opinion that is any deeper than who the credible knowledge producers are.

We see this in the phenomenon of social knowledge coming through the emerging social media.

What is credible (and what is trusted) and how do we know it? Fuller (1987) points out that a premium is placed on works which can render redundant much of what is already in circulation. Think of wikis, those continuously editable Web pages. He tells us that our interpretations and synopses pass as translations for the original work and begin to accrue credibility for their new producers while diminishing “if not entirely subsume the credibility of the producers whose works are replaced” (p. 180). His punch line is that with all these revisions and translations that supplant the original work, retention becomes spotty and “the contents of a text can be lost without ever having been definitively refuted, only to be recovered at some future date to revolutionize the particular knowledge production process” (p. 181).

Fuller’s ideas as well as those of other epistemologists (e.g., Alvin I. Golden, 1986) provide intellectual fodder to our exploration. Isn’t trust just another paradigm of what is intrinsic to survival? It requires a context such as a relationship (with self or other) or a reliance on something more intangible, such as knowledge. Can I trust social media – full of collective intelligence – to provide what I need? Can I trust myself to be cognizant enough to sort through information that may imposter as knowledge and make sense of it? Once, we trusted or were skeptical about what we read or heard in traditional mass media (newspapers, radio, and television). Now we have a different paradigm to navigate. Social media begins to be about new “kinds of communication where factual content, opinion, and conversation often can’t be clearly separated” (Manovich, 2009, p. 326). We see this in blogs where much of an entry consists of comments about something copied from or linked to another source. Likewise, forums generate posts leading to discussions that go into new directions often with the original item long forgotten (Manovich, 2009).

The questions then become: “Is trust a trait, that is, an innate propensity that emerges as a state given certain contexts?” “Can one truly love without trust?” “Do we trust each other not to criticize or hurt the other?” “Do we trust each other to tell the truth and not deceive?” “What is it that I ask you to trust about me?” Our assumption abound at the same time: “To survive in the world, we need a certain adaptive intelligence that relies on trust to initiate behavior.” “Trust can be earned like any other commodity.” “Children are socialized to trust their parents but often learn that it is not an absolute.”

Let me take my thoughts one step further. Inviting colleagues to collaborate to write a chapter requires a leap of trust. Can I trust that my co-authors will contribute in a timely fashion? Can I trust their integrity to give credit where credit is due and not plagiarize others’ works? Must I assess my sense of them when face to face, our interaction through virtual conferences, social networking sites, etc.? How do I *know* that I can trust them? Furthermore, can I trust the synergy that our three contributions will be greater than the whole? Yes. On the other hand, can I trust scientific research to provide me with findings sufficient enough to answer my questions?

Let’s now turn to a brief story that may illustrate some of my thinking. This is about a recent engagement with a coaching client (identity is a composite of several clients). She often struggles with whether or not she can trust some of the people she works with. From my perspective, trust has been a lifelong challenge for her and it’s getting played out in the workplace as if she were in her family of origin. Over time she’s grown to trust me, demonstrate vulnerability, and be more open to the interpretations I make. We often focus on how her goals, much like life, can be nonlinear. She may plan and execute a management decision that does not go the way she predicted given the complex context within which she works. She assumes that things go linearly from point A to Z and gets disappointed when they don’t. Perhaps

Challenging our Assumptions

it's an irrational position but this disappointment fuels her sense of not trusting. Outside of the workplace, she has a few close relationships within her informal networks where she can trust too much. Our coaching work has focused on this critical aspect of adapting to life – finding the best degree and balance between trusting herself and others. These dynamics play out in a coaching – client relationship built on trust. But I can't tell you where it comes from. Psychoanalytic thinkers might call it transference (an unconscious feeling from early life with caregivers that is transferred onto the current situation). Others might say trust is learned each time there are more positive results than negative ones. While it is not my purpose to explore the developmental and behavioral theories regarding trust, I think trust underlies our ability to adapt to life and be resilient to its challenges.

Sal continues the conversation, asking, "What are the languages of social knowledge and how does our use of language build trust?" In his words:

My colleagues, Suzanne and Loretta, are used to my launching into stories. They always take time to be patient with me. After all, trust takes time and time changes (or at least it feels like it does), depending on what form or type of communication we engage in. Trust, however, always begins and ends with ourselves. How we trust and authenticate information today relies on how we respond using the communication tools we now have at hand. While they may seem unique, they are not so terribly different from those found any time in history. The difference may be that today we expect that technology will always change based on our interactions. This is a bit different from waiting to learn what's new. No longer do we live in anticipation for the next World's Fair to exhibit where we are headed. Now, it's just a "start up" time away. The next entrepreneur comes with the morning coffee as we browse the Web. Consider as well, that the role of shaman has moved from the center of the physical circle to the margins of communities that populate the Internet. Every tribe has had its storytellers. To-

day, we interact with them and not just listen. In my view, trust emanates from the ways in which we use and understand language. Let me explain this point of view further by way of some stories.

A Great Mentor Who Understands the Humanity of Language

I first met Cicely Berry when I was a graduate student, working as a stage manager. While touring with members of the Royal Shakespeare Company (RSC) around several New York colleges, Cis and I would often hide out in my Volkswagen Beetle to avoid people who wanted to talk to and be photographed with this world renowned voice expert. We became friends. More than thirty-five years later, in 2007, I co-produced and directed a documentary on her work called "*Where Words Prevail*." The title comes from *The Spanish Tragedy*, an Elizabethan tragedy written by Thomas Kyd between 1582 and 1592. The full quote is: "*Where words prevail not, violence prevails.*"

While working on this documentary, which took several years, we were told by interested people that the subject matter would never make it to television. However, the Public Broadcasting Service (PBS) telecast in the United States alone reached over ninety-million households within four weeks. While Cicely's work focuses on understanding and accurately speaking the text as actors and directors, she continues to be a powerful force helping diverse communities all over the world. She is currently voice director of The Royal Shakespeare Company. A Marxist, she nevertheless earned an O.B.E (Order of the British Empire) and recently, a C.B.E. (Commander of the British Empire). More than one world leader has asked for and accepted her advice.

Cicely's life's work is remarkable from the great stages, to the most challenged living environments on earth. Her workshops on speaking the text of Shakespeare have affected the work of many theater professionals. However, these same workshops have also deeply enriched people's

lives all over the world, in prisons and places such as a Brazilian favela where the ability to speak is often directly connected to survival. People find the subject matter of the documentary *Where Words Prevail* quite accessible because, through her voice work, Cicely always presents an unwavering commitment to the human spirit. Neither position nor power can ever influence her to take that sense of trust away from anyone, regardless of their circumstance. If our “inner voice” is inhibited, as she says, terrible things happen. Nothing should inhibit our ability to trust our need to communicate freely. While she works with the most accomplished actors, directors and writers of our time, Cicely will do the same work with people in places many of us would fear to visit.

Cicely has taught me: “*All we do, we do out of a need to survive.*” For her, a fundamental issue of trust resides in our agreement to dignify all people and to hear one another, no matter what the language. In her latest book, *From Word To Play: A Textual Handbook for Actors and Directors* (Berry, 2008), she writes:

“There are now roughly six thousand languages spoken across the world. By the end of this century it is estimated by linguists that probably only about three thousand will have survived.”

In her statement, she is referring to Mark Abley’s *Spoken Here, Travels Among Threatened Languages* (2005). Cicely also mentions Sello Maake Ka-Ncube, as a “great South African actor” whose native language is Zulu. Ka-Ncube said to her one day: “*Each language has its own way of naming the world.*” With all this in mind, she asks two critical questions: “The essence of just how many cultures are we going to lose?” And, “how are we naming our own culture?”

Walter J. Ong, in his book, *Orality and Literacy: The Technologizing of the Word* (2002), an exploration of the differences between oral and literate cultures, makes a clear distinction between our traditional languages and what he calls “...so

called computer languages.” So-called computer languages resemble human languages (English, Sanskrit, Malayalam, Mandarin Chinese, Twi or Shoshone etc.) in some ways, but are forever totally unlike human languages in that they do not grow out of the unconscious but directly out of consciousness. Computer language rules (‘grammar’) are stated first and thereafter used. The ‘rules’ of grammar in natural human languages are used first and can be abstracted from usage and stated explicitly in words only with difficulty and never completely (Ong, 2002, p. 7). This provokes a thought. Does grammar actually create a framework for trust? Was that a fundamental role for the development of grammar? How are we changing that framework with “computer language” and social knowledge exchange?

Is There a Language of Social Knowledge That Does Not Exclude People?

For Cicely Berry, it’s our drive to be literal with today’s language that she finds dysfunctional and not expressive. She communicates concern and describes issues such as the business language of the Internet. She asks if it will actually change the right- and left-brain use of poor people. She questions our ability to “hear language.”

I recall reading several years ago about The World Economic Conference at Davos, Switzerland, where it was stated that over 500 million people were already using the Internet while more than 400 thousand people had yet to make their first phone call. Cicely’s wisdom questions our ability to ‘hear language’ as she puts it. Her discussions of social knowledge and information sharing provoke me to question the way language is getting reduced to a new shorthand today. LOL, K, BFF, are now complete thoughts.

In another example, Cicely explains that the primary form of entertainment, during the early days of the Gold Rush in America, was reciting the words of Shakespeare. Because many people

Challenging our Assumptions

could not read, the words were passed on from one prospector to another. The heightened language was a delight to the well-worn workers in pursuit of gold. Perhaps, the rhyme and rhythm provided a sense of relief and relaxation, while sharing history with their everyday realities. What was it that they shared as social knowledge? They could hear the language and speak it. Cicely often points out that reading Shakespeare is very different than speaking it. That's why so many literary critics miss the humor, sexuality, and political importance of Shakespeare's works. I witnessed this while filming teenagers in one of Brazil's most dangerous favelas one day, as the students were analyzing a scene from Hamlet after one of Cicely's workshops. The discussion was startling. And the one-week, ten-hour a day workshops were totally energetic and productive. The students were never bored and always focused on the work. We could regularly hear the usual gunshots from the neighborhood. In that extremely difficult environment, with a great mentor present, we all could hear the language of their lives.

Drive Through Trust or, An Integrated Supply Chain of Trust? It's our Choice

Today, we demonstrate our sense of trust or we authenticate truth for ourselves in new ways—often in collaboration with people or entities we know nothing about. Take the ATM machine for example. If my grandparents had been told forty years ago that they would put an identification card into the machinery of a bank with which they had no relationship, who may even be a competitor of their chosen bank, they would have never believed it to be sane. Yet, every time we insert a debit card to get the money we want, there exists a system of partnerships and alliances that work for thirty seconds or so, to authenticate, before the twenty bucks slides out with a receipt loaded with highly confidential information.

We live like that in many ways today. Traditional transaction, while implicit, is also now represented by a completely different set of circumstances that rely on an integrated supply chain of trust. In the very fundamental issues of survival -- health, finance, and politics, we are providing an astounding collection of living metaphors that name our world. In the words of young Michael, if you want to learn. .. “don't keep secrets.”

Making assumptions about trust is always a risk. The word trust may be interpreted as something that creates safety. For example, when is it safe to share information with a trusted person or group of people?

However, the intentions for seeking trust may not always be unilaterally safe to everyone.

Here's a story published by KTLA in California, in 2009.

Cyber Thugs: Gangs Use Facebook, Twitter to Recruit and Organize

KTLA News

12:44 PM PST, November 19, 2009

“ONTARIO, Calif. -- State lawmakers are holding a hearing today in Ontario to discuss the rise in the number of criminal gangs using networking sites like Twitter and Facebook.

Officials say the hearing entitled “Gangs 2.0: The Emerging Threat of Cyberthugs” will explore the use of social networking tools in gang recruitment and gang-related crime.

Assembly majority leader Alberto Torrico, and attorney general candidate says gang members both in and out of prison are making more use of technology.

“Social networking is a great way to reach out to others, update them on activities, exchange information and support a cause,” Torrico said.

“Unfortunately, gangs are using these tools to communicate, recruit, issue threats, traffic narcotics, promote violence and expand their criminal activities.”

According to Torrico's office, gang members are heavily involved on social networks, with a recent survey finding:

70 percent of gang members say it's easier to make friends online than in the real world 89 percent of students say they are the primary users of technology in the home 41 percent do not share with their parents where they go on the Internet

Cell phones are another tool used by gangs to coordinate activities, including among members who are already behind bars, Torrico says.

Over 4,100 cell phones have already been confiscated in California state prisons this year and corrections officials consider them a top security threat”.

Questioning our assumptions about this story might also ensure that we not discount the potential or actual value of social networking to positively affect gang and prison issues.

What determines our ability to develop ethically and be truly grounded in respect for our humanity is now (as it has always been) directly related to how we communicate. I have a bias. I believe that something about our methods of “formalizing” information in education and in many business organizations makes us believe that we should underestimate our imagination.

The philosopher, Immanuel Kant in *The Critique of Pure Reason*, implies that the imagination is the seat of our logic. In that sense, the fundamentals of trust reside in our ability to see the imagination as an organizer of truth and not some human methodology for whimsical thinking. We are taught to revere the imagination as artful and distrust it as a means of deeper understanding of reality. Our imagination is meaningful to helping us understand today's visual and audio driven environment for sharing social knowledge. And, we must take care not to exclude those who may not see or hear. Hearing language is part of our humanity, no matter what our circumstance.

In business, traditional transformation over the last two decades has included concepts such as:

common process, information management, and building collaborative behaviors. These are all ways of work in which organizations invest time and money with the purpose of achieving and then measuring profitable change. Today, we also share accountability within instantaneous supply chains that must generate trust in conducting business.

Stéphane Garelli (personal communication, 2008) is Professor at both the International Institute for Management Development (IMD) and the University of Lausanne. He is an authority on world competitiveness and also the director of the IMD's World Competitiveness Center: his research focuses particularly on how nations and enterprises compete on international markets.

I asked him in 2008, why he had added the concept of «vulnerability» to his list of competitive benchmarks?

*“Dear Mr. Rasa,
I am indeed highlighting the fact that vulnerability is a key concern for CEOs today. The outsourcing policies that we have seen during the past decade have lead to a value chain that is leaner but longer. It means that every company is now confronted with a multiplication of partners to work with. As a consequence, the level of complexity has increased and also the level of vulnerability. In the latter case, it means essentially that if a link of the value chain is exposed to a breakdown, it can stop the entire value chain. Even a small business partner can stop a larger company from operating. I hope that this will be useful.”*

Sharing knowledge through social networking and media has never been solely a corporate owned entity. However, the direct affect to ROI and the bottom line becomes more and more evident as technology and behavior intersect.

In the time it has taken to write these thoughts, informal networks of people around the world have made informal agreements based on trust that will make it less possible tomorrow morning for large companies to accurately measure the value of the

Challenging our Assumptions

organizational changes they have invested in over the last ten years. You may hope that's an exaggeration. It is not. In large organizations, where phrases like "task force," "communication plans," and "employee campaigns" are still used, workers will have networked their collective intelligence far ahead of the management strategy timeline to achieve expected results. Measurement of such initiatives is often illusory. Examples were painful for companies such as American Telephone & Telegraph (AT&T) and International Business Machines Corporation (IBM) when information regarding downsizing and retirement changes were accelerated by employees talking to employees.

Loretta reflects and responds to these ideas with an eye to the world of social media. She continues:

The expectations and means for communication began a major pattern of shifts from oral and printed modes more than one hundred fifty years ago. In *The Social Life of Information* (2000), John Seely Brown and Paul Duguid suggest that the telegraph was the first technological change to accelerate the rate of information dissemination from the rate of human travel. The addition of each successive technical medium for mass communication has increased the pace and span of information sharing, with the telephone, radio, movies, and television achieving larger audiences and greater immediacy. Even with the arrival of Internet technology, the ratio of originator to audience remained 'one to many' as a single author or source broadcast information to the masses. There was little means for the receiver to interact with the sender. Technology had caused a level of interference in the social aspects of communication. The underlying beliefs of the producers of software, and its component digital code, gained a belief in their personal power. They became the driver of new egalitarian ways of work and work products: free agents and open source technologies. And this is the intersection of trust, communication, and social media. It has spawned a new concept, "Radical Trust." Collin Douma (2006) explains how this sweet spot calls for a new re-

lational contract among those who participate in the culture of social media (especially in relation to consumer markets):

You must radically trust that people:

1. are best equipped to determine their own needs, and left to their own devices are best equipped to get those needs met.
2. would rather be communicated with than spoken to.
3. require freedom of expression, but often require guidelines to create expressions within.
4. will self-regulate communities to the level guidelines suggest and that the collective group they comprise will accept.
5. will disconnect with a brand that silences them and will align with brands that give them a voice.
6. (This one is the hardest) People are inherently good.

In 2006 the concept of Web 2.0 was barely two years old. Chris Heuer saw the potential of this new form and co-founded the Social Media Club so people would assemble to share knowledge about social media, technology, and related topics. He explains why he promotes social media as a means to come together:

Because participation is more broadly available across society, it is the contexts in which we interact with others that is most crucial – within those contexts we communicate with each other and if through those communications, we reach agreement to trust one another, we can collaborate towards common goals. (Heuer, 2007)

Heuer and I both offered to assist Sandy Heierbacher, founder of the National Coalition for Dialogue & Deliberation (NCDD) at a 2006 San Francisco conference and to bring social media onto the radar screen of community advocates. They placed their trust in us to take them into a

realm they never envisioned, yet alone participate in. We had, by means of a social contract, mimicked the relational trends we were demonstrating.

Early adopters of new Web technologies seem to enjoy the risk and thrill of trying something new. They seem to operate more from instinct than from any other motivation. However, trust is essential for the second wave of users, the people who are next to adopt new ways of living, working, and community. That cohort needs trust in the technology, the security of support, and the community of users they can reach out to. An example of that occurred as Heuer and I met Juanita Brown whose brainchild is the The World Café (TWC), a method for convening in-person conversations around critical issues. She already had an online forum but was entranced by social media and started a blog right after our meeting. What she wanted to inspire needed social media and led to the launching of The World Cafe Online Community using Ning, a social collaboration site (<http://www.theworldcafecommunity.org>). John Inman, a TWC community member, posted a comment that demonstrates the importance of the underlying premise for the practices and beliefs shared among the members, “Trust in the conversation and trust in TWC process as that is where all of the work is done.” With over one-thousand members, this community of practice relies on technology and the presence of trusted members to be a vital force for enhancing the skills and tools for robust, thought-provoking digital conversations.

So what is it that we are counting on in our relationships, collaborations, and technology when we refer to trust? Theorists have made us keenly aware of the need for trust while they look at this construct through many lenses. Since our perspectives are multi-disciplinary, a definition that has been derived by finding the commonalities across many fields is especially suitable. For that reason, the multidimensional definition proposed by Megan Tschannen-Moran and Wayne K. Hoy (2000, p. 556) is one I have adopted: “Trust is one party’s willingness to be vulnerable to another

party based on the confidence that the latter party is (a) benevolent, (b) reliable, (c) competent, (d) honest, and (e) open.”

In my mind, as the relevance of social media to our lives and work has already made its mark, the human factors that establish norms for interaction are no different from those we have valued and adhered to in our face-to-face associations for centuries. Recommitting to them and adapting them to a Web 2.0 world is what we invite you to consider.

ASSUMPTIONS

Sal takes the lead as we explore our second point of departure, assumptions. In his view, Assumptions Can Be Comforting.

Christopher Columbus did not set out to prove the world was round. During his time of exploration, the scientific community had pretty much come to that conclusion. It was really about business, spices, power, and misconceptions about “other worlds.”

After many centuries, we still teach children the wonder of his quest. The only problem--the assertion and the assumption to that sense of wonderment has little to do with the reality of his quest. But it’s an easy tale to tell. The common understanding about Columbus is poetic in the sense that our ability to exchange social knowledge has for centuries conditioned us to separate common exchange from empirical data.

We believe what we are told or what we read, often without looking for other forms of documentation. Questioning, however, is also part of our nature. And, when we question or seek documentation, we sometimes accept results, even when they contradict our individual or collective experience. How long has it taken, for example, to learn about the horrific practices of Christopher Columbus along his journey and do people indeed really believe the evidence even today? Depending on what community one relates to, the reality

Challenging our Assumptions

may be more or less compelling than continuing to spin an inaccurate story.

We have a need to “authenticate.” Social media from the days of the cave drawings to our current posts and blogs push the virtual envelope of forcing us to confront our sense of articulating our experience. Social knowledge creates the kind of disruption that helps us to authenticate.

What is Today’s Equivalent of Saying that Columbus Set Out to Prove the World Was Round?

One might consider that social knowledge sharing focuses on the conversation rather than just the hypothesis or single question. Mass data allows for different questioning than just a single story. In fact, traditional business models are changing or attempting to market their need to change as a value to clients and customers.

Take for example, the Public Relations business. It’s the nature of PR to tell stories. Listen to what large PR companies describe as their mission today.

Phrases like “facilitating the conversation.” “We don’t create the message anymore, we help people to tell their story” and “Advocacy” are common terms that I have heard in discussions with PR executives.

I am not disparaging any particular skill or type of organization. I am saying that concepts such as Web 2.0 and 3.0 will be and are already being commoditized as a kind of “value add.” That kind of manipulation may not necessarily drive progressive transformation to accelerate the ease and relevancy of social knowledge sharing.

Authenticating is a Process of Understanding and Not a Paternal Dictate

Clarity resides in development of perception in the context of what is real. From the point of phenomenology, the truth is revealed through the

use of our inquisitive imagination to determine a reality. What is real, we cannot change. Martin Heidegger said: “reality not the real, is dependent upon care.”

Social knowledge is more complex than telling stories and more fundamental than the technology formats that we know will constantly change.

Take for example, a recent statement from a New York head and neck surgeon regarding treatment to a man with an injury to his hearing. *“The information flow through his electronic medical records demonstrated an injury due to an altercation.”* The legal and medical issues became integrated. *“His treatment from one physician to the next was always connected to the altercation. Until, it got to me. My examination clearly demonstrated that his problem had nothing to do with the altercation. Yet, an entire stream of documentation and treatment were based on the earliest of the recorded electronic documentation.”*

That story demonstrates how not questioning assumptions can create a false sense of trust.

Here’s Another Story

A doctor of informatics, whom I recently worked with, told another story. While I was documenting on video how eighteen medical professionals experienced their first year of using electronic medical records, this physician spoke of his compelling experience with two long-time adult patients who could not read. For the first time he said, the graph-like images from the electronic records offered these people a way to see how their health issues were working out and where compliance and treatment were needed. He spends 40% of his time now with patients and 60% with technology issues.

This recounting of this story and putting these eighteen professionals into a cross boundary conversation had significant results. Information sharing was quickly increased and actual bottom line improvement was achieved for patient care and hospital costs. The unspoken realization was

also addressed, that people within the organization were actually being conditioned not to share information with one another. Imagine that in a hospital?

Today, we use rapid technologies to convey what once took time for consideration --and time to build trust. We are working in ways we never did before. Fast information does not necessarily create more credibility or deepen trust. Those qualities are, as always, fundamentally connected to our intentions. Technology exists to carry out our intentions. Speed of information can reduce unnecessary conjecture and task. It cannot supersede intention. Questioning online has become for us a kind of business transformation that large companies went through over the last two decades. CRM (customer relationship management), Knowledge Management, ERP etc. etc. Now, we are realizing that concepts such as Knowledge Management are more dynamic than prescriptive. That we move from event to event and not from repositories only. Questioning assumptions becomes more and more part of the conversation and not just a response. We are learning this.

What do we convey and why? Who do we want to reach? And, the realization that we may not know the people we reach nor do we always care about the recipient. The questioning of assumptions within the realm of social knowledge is an opportunity for us to learn how to learn. It is also part of our being.

There is something in the expression of social knowledge that may seem the business of a solip-sist, but that does not necessarily mean suspect in nature or sinister in our intent to communicate. We choose to be expressive because that is human.

The cave wall has become virtual. Often, on places like Twitter, you will see someone complaining about a person who only posts things to point out how intelligent they are. The intention becomes questioned and the content is overlooked. That is also very human.

Lawyers and Judges Don't Think So Highly of Eye Witness Testimony

Visual and audio data affects us. Different people see and hear the same message differently. Here is an interesting reference which illustrates this. It's not the scientific positioning or accuracy that I am testifying to. The reference, however, provides an interesting perspective on questioning something as basic as our eyesight.

“Unconscious inference. Hermann von Helmholtz is often credited with the first study of visual perception in modern times. Helmholtz examined the human eye and concluded that it was, optically, rather poor. The poor quality information gathered via the eye seemed to him to make vision impossible. He therefore concluded that vision could only be the result of some form of unconscious inferences: a matter of making assumptions and conclusions from incomplete data, based on previous experiences.

Inference requires prior experience of the world: examples of well-known assumptions - based on visual experience - are:

light comes from above

objects are normally not viewed from below

faces are seen (and recognized) upright

The study of visual illusions (cases when the inference process goes wrong) has yielded much insight into what sort of assumptions the visual system makes.

Another type of the unconscious inference hypothesis (based on probabilities) has recently been revived in so-called Bayesian studies of visual perception.

Challenging our Assumptions

Proponents of this approach consider that the visual system performs some form of Bayesian inference to derive a perception from sensory data. Models based on this idea have been used to describe various visual subsystems, such as the perception of motion or the perception of depth.” (Eyesight, 2009)

I was taught in school that a human being looking at a perfectly flat white plane becomes blinded. If that is true, then it supports the idea that we need disruption and obstruction to be able to see clearly. A critical question of this book chapter is to ask: In today’s world of constantly changing technology and mass data potential, **how do we ask the questions that we are not even aware of?**

Does the very nature of social knowledge exchange provide a contemporary and continuous set of disruptive signals so that our perception becomes sharper? Or, are we sharing and co-developing an ability to learn in a time we really have not seen before? Is that drive to learn as significant as the knowledge we share?

Another take on assumptions is offered by Loretta. Her interest in knowledge co-creation honors the person as a reliable and competent source.

In the domain of digital collaboration and social media, assumptions of who the contributors are become less useful to the process of knowledge creation than transparency and authenticity about individual and group competencies. We might take for granted that everyone in the social space is knowledgeable - suggesting “knowledge” is a generic construct. So, if they “know” something, they possess a homogenized understanding and use of some concept or skills. There are shades of understanding, however, as demonstrated in many facets of life.

To clarify the competencies of a Web 2.0 world, Joan Torrent (Peña-López, 2009), however, enumerates four varieties of knowledge:

- Know what: observable knowledge, non-rival, ability of exclusion, high increasing returns, decreasing marginal utility, lock-in
- Know why: observable knowledge, non-rival, medium ability of exclusion, high increasing returns, decreasing marginal utility, lock-in, network spillovers
- Know how: tacit knowledge, low exclusion, medium increasing returns, decreasing marginal utility, low barriers of exit, network spillovers
- Know who: tacit knowledge, low exclusion, medium increasing returns, decreasing marginal utility, low barriers of exit, network spillovers

In similar terms, psychologist Howard Gardner offers “multiple intelligences,” the aptitudes for learning and using certain types of knowledge, as a way to value and differentiate talent. In 1983, he published *Frames of Mind*, the book in which he introduced MI theory.

My research in cognitive development and cognitive breakdown convinced me that this traditional view of intellect is not tenable. Individuals have different human faculties and their strength (or weakness) in one intellectual sphere simply does not predict whether a particular individual will be strong or weak in some other intellectual component. I developed a definition of intelligence—a biopsychological information-processing capacity to solve problems or fashion products that are valued in at least one community and culture. I think of the intelligences as a set of relatively independent computers. One computer deals with language, a second with spatial information, a third with information about other people. (Gardner, 2005, p. 6)

Because Gardner wrote his book as a psychologist, addressing principally his colleagues in psychology, he had no expectations for the application of his ideas to the mainstream. As

we come together to co-create new knowledge, the variation of ways in which each person can contribute to building new concepts and applying them as intellectual capital becomes an assumed asset of the community. We have the expectation that differences exist, and that those are ways in which our virtual social relationships, communications mediated by various forms of technology, and complexity of thought and solutions benefit from them.

Suzanne enlightens the conversation by confronting resistance to social media and the preconceived notions that surround the sharing and social creation of knowledge.

Assumptions come in all shapes and colors. We assume the sun will rise tomorrow and we are correct. We assume that there is something to learn from social media. We assume we will learn something relevant by using search engines and that may be or may not be so. I assume many people resist change for a variety of reasons. I have been surprised how many psychology colleagues avoid learning about social media. What I don't understand is how someone engaged in the understanding of human behavior would be so resistant to considering new technologies to further clinical or non-clinical goals. A friend sent me a blog posting that reviewed copyright holders' claims demanding restrictions on their inventions, essentially attempting to thwart innovation:

The anxious rhetoric around new technology is really quite shocking in its vehemence, from claims that the player piano will destroy musical taste and the "national throat" to concerns that the VCR is like the "Boston strangler" to claims that only Hollywood's premier content could make the DTV transition a success. Most of it turned out to be absurd hyperbole... (Anderson, 2009)

There is so much fear around how social media is impacting personal relationships, cognitive and language skills. Then there are others who assume that it is the source of collective knowledge that

can be useful even to solve sticky problems. So many assumptions. Show me the research or show me the facts which, by the way, we know may one day be disproven!

Researchers are developing algorithms and other methods to make sense of our social knowledge from natural occurring language in objective texts such as newspapers to more subjective content found in blogs and other postings. In the newness of the quest for making sense of social knowledge through social media, new methods have emerged but many are not commonly accepted making it more problematic to dialog across boundaries about the art and science of knowledge.

Emotions are an integral part of many text types and form a central role in the emerging social media, which are focused largely on sharing experiences and ideas. The automatic analysis of texts for their emotion content is desirable for many purposes, but the exploratory research to date has not settled on standard notions. (Hakki, C., Cankaya, H. C., Moldovan, D., 2009)

As Web users continue to participate in social media, contributing new content, rating it, expressing opinions and commenting on digital content found in articles and video as well as real world product,

...they organize online content by tagging it and they participate in online communities. As a result of this massive user participation in Web applications, large amounts of user-generated data are collected. Combining the behavior, preferences and ideas of masses of users that are imprinted in this data can result into novel insights and knowledge; this process is frequently denoted to as the emergence of Collective Intelligence. (Papadopoulos, S., Kompatsiaris, Y., Vakali, A., 2009)

Recently I communicated with my cousin Tristan, an Internet entrepreneur. Our online chat

Challenging our Assumptions

reflectively focused on the language we were using to communicate.

T: tyvm

S: *translation please*

T: Thank You Very Much. You're interested in social behaviors right?

S: *Yes very much*

T: I have been saying for years now that Internet vernacular will become part of real world speech, and I see that happening already -- things like "lol" and "brb" tyvm. I first noticed it with emoticons (:) & :P) those would appear in emails and letters and then abbreviations showed up online and those quickly caught on with BFF being one of the first

S: *BFF? I need to become more literate. BTW*

T: BFF = Best Friends Forever, but it's lost that exact meaning these days. Now it's used to describe a best friend. Turn on E! for 20 mins and I am sure you will hear it and many other Internet sourced terms.

I noticed you know BTW also part of the same phonon

S: *Yes that was my first*

T: :) [read turning around smiley face}

S: *That I haven't seen a emoticon that moves. There is clearly a psychology to all of this.*

T: I just emailed you our chat btw

S: *btw tyvm*

T: Nice (not short for anything) oh oh to finish up on my point. I believe this trend is going to continue until you see these terms in the English dictionary and used as frequently and easily as the word 'The.' One example of that is google -- to google is an acceptable verb.

S: *That makes sense because it seems that society is providing the content for so much.*

T: Here's a funny example of this phonon <3 [read heart shape] is an Internet term

"<3"

S: *It used to take so long for a word to be JUDGED worthy of a dictionary but those rules have loosened quite a bit with wikis, etc.*

T: It means "i love"

S: *Did not know that*

T: Last year was rejected from being included as part of the English language and cannot be considered a word officially but here is the funny part there are no letters in this "word" so how could it even end up on the considered list?

S: *I am thinking about hieroglyphics*

T: I think we might be headed back in that direction the pendulum is swinging back.

S: *What a cool insight*

T: Well most things in this world are cyclical right? Almost makes sense.)

S: *Yes they seem to be -- maybe in our lifetime we'll be reading signifiers that are not letter words but convey as much or more meaning and culture*

T: What do you mean maybe? Teens communicate with <3

S: *Ok definitely*

T: It's in our lap. My child will not be talking English, but tech-english...

[His son was born three days later]

Given that this section is about assumptions, let me share mine. I assume that much of the social knowledge on the Internet is based on masses of information and self-expression from masses of people coalescing. I had hardly considered how masses of people are creating, not just content but new dictionary worthy language -- nouns, verbs, and perhaps one day, symbols. This led me to wonder about what my 5 year old niece understands about learning. Borrowing Sal's interview questions at the beginning of this chapter, I did my own investigation.

Q. What's an example of what your teachers teach you?

A. *They teach the pink tower. They teach us the listening lesson. They teach us all kinds of lessons and some times and plusses.*

Q. Do you learn things from other people than your teachers?

A. *Like my mom or my dad? They teach me how to read. How to take turns. They teach me how to rollerblade.*

Q. Do you teach other kids?

- A. *Yeah. Um -- I teach other kids how to cook. I teach other kids how to read. I teach other kids how to take turns. I teach other kids how to do monkey bars.*
- Q. Do you know about the Internet? What do you like about it?
- A. *Yes. It has pictures about Halloween and all that and it teaches you how to carve online. It teaches you how to make cupcakes and pasta.*
- Q. Do you know about Facebook?
- A. *Facebook is where you actually have these words on the computer on the Internet and friends can be mean on the Internet sometimes because the ones you really like may be really mad and put the ones you love on the computer. Like somebody really likes John... [Relates to something she observed with her older sister Camden]*
- Q. Do you like to learn things from the other kids?
- A. *Yes. Like doing um like how to yo-yo.*
- Q. How can I learn things, because I don't go to school anymore?
- A. *If you read you can learn the things all around the world.*

Suffice it to say that I learned much from this 5 year old about knowing what we know. She is learning interpersonal skills (listening and taking turns) and physical skills (monkey bars, rollerblading, and yo-yo) from her interaction with people. But she is also discovering how-to knowledge (how to cook, how to carve) from Internet demonstrations. She believes that she is teaching other kids what she knows. And suggested to me I can learn through reading “the things all around the world.”

It was striking that a 5 year old understood the social networking site Facebook to be a place where strong feelings such as anger and love could be expressed. I became curious about her sister's experience and asked Camden directly:

- Q. Do you know about the Internet? What do you like about it?
- A. *Yah. It's easy to use. I like it because you to go Facebook and Google and stuff. It's kind of like the iPhone. It's easy to use. You know what's really funny -- I am on Facebook now and people are texting me and I am trying to talk to you. [We were on the telephone.]*
- Q. What do you like about Facebook?
- A. *You can post what you're thinking and see what other people are thinking through their posts. And you chat with other people.*

Turning from what two children know about knowing to what researchers explain about knowing, we move into the territory of collective intelligence. Knowledge, once in the domain of philosophers, was found at a premium in the hands of experts in the 20th century. But this hierarchical structure of creating knowledge toppled with social media. David Snowden (2002) reminds us that knowledge cannot be constricted; it can only be volunteered. But can knowledge be captured? The assumption exists that there is social knowledge somewhere within interaction of social media. How does this become collective intelligence?

Knowledge capture is the focus of numerous global professionals. Some explore Weblogs as a source for extracting general world knowledge (Gordon, J., Van Durme, B.; Schubert, L., 2009). Others design methods for extracting common-sense knowledge (Hakki, C., Cankaya, H. C., Moldovan, D., 2009); methods for mining emotional content of dream diaries (Frantova, E; Bergler, S., 2009), or for community detection techniques leveraging collective intelligence (Papadopoulos, S., Kompatsiaris, Y., Vakali, A., 2009).

In an area of particular interest, the question is: How can we capture “social knowledge” created through medical research, clinical trials, doctors, and patients impacts people with serious or life-threatening illness? Is there some collective repository of emergent wisdom that may save a life? We see self-organizing support groups com-

Challenging our Assumptions

ing together to dialog about side effects, medical conditions, resources, and of course to provide hope and support. Medical specialists share knowledge across global teams and within specialized social networking sites. How do we locate truth, assumptions, and reality in these conversations?

Medical and mental health care information is the number one search on the internet. While there are opportunities to share information leading to greater benefit to people, pharmaceutical businesses tend to resist the use of social media. There are many forces at work.

The order of complexity that arises out of the tasks involved in creating and cultivating safe and engaging environments for patients, doctors, pharmacists, employees and all other publics grows with every added layer of interaction. (Baumann, 2010)

One of those critical layers includes economic impact. Phil Baumann (2010) suggests that life science businesses reconsider the nature of profit in a fresh way where “where social currencies emerge as substantive elements in the Capital System at large.” It strikes me that social knowledge through interaction is one aspect of 21st century wealth which can no longer be defined in 20th century financial terms. If life sciences businesses continue to avoid social media, albeit a complex endeavor, we may be suffocating social knowledge where it counts the most, saving life.

Most psychologists do not become exposed to the field of knowledge management. Without a conscious effort, it’s possible to miss the field all together. Several years ago, I became uneasy about the silos across many disciplines that I decided to see what was going on outside of my field. I had some inspired training by David Snowden who exposed me to complexity, narrative, and pattern recognition. Soon I met new colleagues (David L. Hawthorne, Patti Anklam, Mary Lee Kennedy, and JC Spender) all quite verbal about knowledge management. But it was David Gur-

teen in particular who gave me the opportunity to become the Regional Director of the Gurteen Knowledge Community in New York City. It has been in that capacity that I have seen the true power of face-to-face open conversations about trust, transparency, assumptions, reality, social media, organizations and more.

In my work as a psychologist, I am often struck by how assumptions shape the way we see our self and the world. To be confronted by assumptions that alleviate our discomfort is perhaps the work of a best friend, psychotherapist, or organizational consultant. After all, “your pain is the breaking of the shell that encloses your understanding” (Gibran, 1923, p. 52).

REALITY

The issue of real and true knowledge is addressed by Loretta as she considers creators and consumers of social intelligence.

The headline was alluring, “*Statisticians reject global cooling*”: *it all depends on the meaning of “decrease,” “trend,” and “virtually assure.”* Among the topics that overwhelm, confound, and irritate me, global warming is close to the top of the list – so I browsed to see what the author had to offer. The article was a posting by Andrew Gelman, a professor of statistics and political science and director of the Applied Statistics Center at Columbia University. His thoughts on the apparent shift in opinions of two major scientists may make you wonder, “What is the truth about global warming? Who can I believe? Is any of the information in online articles, blogs, wikis, and social sites factual?”

The answer to this question lies in several domains: cognitive science, behavioral science, and the emerging technologies for pushing and pulling information. The dialogue of these three authors traces these domains as certainty is a complex issue and the limitations of prior frames of reference are being explored.

By 2005, the explosion of user-created media content on the Web unleashed a new media universe (social media). This phenomenon was not just a scaled up version of 20th century media culture. We had moved from media production by the few in a Web 1.0 paradigm to social media in a Web 2.0 world. In this new world, we extend beyond the boundaries where content was once published by a small number of professional writers and producers. It now placed an increasing number of users in a larger space in which communicating involved accessing, co-authoring, and distributing content produced by other non-professional users (Manovich, 2009). Although we consider this shift paradigmatic, statistics show that only a few still produce for the many.

These trends do not mean that every user has become a producer or that every user consumes mostly amateur material. According to 2007 data, only between 0.5 percent and 1.5 percent of users of the most popular social media sites (Flickr, YouTube, Wikipedia) contributed their own content. Others remained consumers of the content produced by this 0.5–1.5 percent (Manovich, 2009, p. 319-320).

How do we make sense of this shift in content production and dissemination, particularly in terms of social knowledge and knowing what we know? How do we locate social knowledge among all this communication? What is knowledge and what is simply social noise? It seems to us that originality of thought is blurred and social construction honored in this new world.

The quest for real knowledge is at the heart of social media and computing. Defining what is “real” in an environment of socially constructed knowledge is a primary challenge. Let’s start with the limitations of schema and mental models that constrain individuals and their online and in-person collaborations.

Cognitive psychologists, psycholinguists, and knowledge management professionals speak of “schema” (or schemata) to explain comprehension and classification of information. Basically,

schema theory states that all knowledge is organized into units. Within these units of knowledge, or schemata, is stored information. A schema, then, is a generalized description or a conceptual system for understanding how knowledge is represented and how it is used. According to this theory, schemata represent knowledge about concepts: objects and the relationships they have with other objects, situations, events, sequences of events, actions, and sequences of actions.

To see how it works, think about your computer as an example. Within that schema you most likely have knowledge about computers in general (screen, keyboard, hard drive, software) and probably have information about specific computers, such as types (desktops, laptops, mainframe) or brands (Dell, HP, Apple). You may also think of computers within the greater context of information storage and sharing equipment. That means computers can be an archive of information stored in various formats, and they can make information available to other computers and people by way of networks. Depending upon your personal experience, the knowledge of a computer as a form of personal technology (used for homework or as a means to interact with friends) or as work technology (that supports projects, file sharing and business communication) is part of your schema. And so it goes with the development of a schema. Each new experience incorporates more information into one’s schema. This process affects both the givers and receivers of information.

Mental models are shared notions. The idea of the mental model as a “small-scale model” of reality can be traced to the work of Kenneth Craik (1943) who stated that mental models can be constructed from perception, imagination, or from the comprehension of the discourse. In the world of social media, discrete pieces of information are coalesced and reshaped by the players. The ways in which concepts are mutually understood is foundational to their being categorized as truth, fiction, desire, malice, etc. Social constructionism comes from a belief that there is no absolute,

Challenging our Assumptions

objective reality. From that follows the notion that when people and groups interact in a social system, they will develop concepts or mental models of each other's actions. After a while these concepts become built into their roles, and how they relate to each other. The culture of their mental models and relationships sets the stage for how they become accustomed to seeing and believing what is real.

With those frameworks in mind (schema, mental models, and social constructionism), we can tackle the question of reality.

Realism is the doctrine that an external world exists independently of our representations of it. Representations include perceptions, thoughts, language, beliefs and desires, as well as artefacts such as pictures and maps, and so include all the ways in which we could or do know and experience the world and ourselves. Relativism repudiates this doctrine, arguing that since any such external world is inaccessible to us in both principle and practice, it need not be postulated or considered. (Cromby & Nightingale, 1999, p. 6)

The inherent desire to share information on behalf of creating collective knowledge is mediated by behaviors such as truth-telling, deception, and politicizing. Beyond those social behaviors, new mediators of reality have emerged from strictly technological properties of social media. The technical prowess and presence of opinion creators makes their information more readily available as search engines move contributions to more prominent positions based on accessibility, rather than their reliability. This phenomenon causes information to be noticed, disseminated via links, and replicated in whole or part in other sites or formats. The result is an increasing quantity of information which lacks quality control for its value or capacity to broaden and build the knowledge base.

Suzanne adds another layer of thinking to the question of reality.

There's not much to say about reality. Okay maybe there is. If I want to make sense of what this chapter is about, I might ask: what does interacting with social media mean to people? Even though it is a shared experience, it holds radically different meanings (reality?) for each person. Phenomenological research (Willis, 2001) might surface some of those meanings. It might go beyond interpretations of the reality to a description or bracketing of "the things themselves." We would have the essence -- although fleeting -- of what we call social media and how we use it to know what we know.

A group of educators decided to study learning within a virtual community of practice (CoPs) using collective intelligence tools. They examined their own reality -- a spiraling process "to achieve a shared understanding of learning theories that influence learning in social networking environments" (Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., Tuttle, R., 2009, p.15).

They report:

Our wiki's history function facilitated socially mediated metacognition by enabling us to reflect on our development process as a group, as we critiqued each version of the paper edited by group members. We were able to generate reflective feedback through blogs and the comments function of the wiki. The wiki and the blogs captured the interactive nature of our group's metacognitive monitoring and regulation. Our mutual reflection on our group learning and development process, Web 2.0 tool use, and the worthiness of our approaches to achieving the group goal facilitated socially mediated metacognition. (Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., Tuttle, R., 2009, p. 15)

Knowledge creation and reflection share a symbiotic relationship. We view the account of their learning experience as a strong example of how social media tools can contribute to understanding

how we know what we know. It is reminiscent of Nonaka and Takeuchi's "dynamic model of knowledge management, view[ing] knowledge as activity rather than object and focus on knowledge creation, collaboration and practice" (Chatti, M. A., Klamma, R., Jarke, M. & Naeve, A., 2007). It also brings to mind David Gurteen's (1998) paradigm busting question: "what is the relationship of our knowledge to reality?"

I implied earlier that trust, assumption, and reality were part of my socialization as a scientist-practitioner (that is, psychologist). Trust being requisite to change and assumptions being cognitive biases that shape our sense of reality. How does one speak of reality? I am partial to a socially constructed view of it -- a la Jerome Bruner (1990) & Kenneth Gergen (1991). We tend to privilege our sense of what is real and omit what does not fit our mental schema. How does one speak of reality in a way that is not abstract but instead phenomenological? I guess we speak *our experience* of "reality" -- writing this chapter with two trusted and respected colleagues has been real. Particularly rewarding is the idea that this is not an ending but a beginning. My colleagues came up with the idea of a living chapter perhaps paying homage to post modernism. In other words, our conversations continue and you can become part of it. Reality. Really.

For Sal reality is a beginning and not a conclusion.

When the philosopher Martin Heidegger (1926) said: "reality, not the real is dependent upon care," he was in part referencing the German words, *sorg* or, *besorgen*, which can mean taking care with the affairs of our lives. What is real we do not change. Reality is something we share and can affect.

We do not want to arrive at a conclusion for our contribution to this book. Rather, it is our intention to provide a beginning and offer readers the ability to carry this conversation forward. Looking into the future depends on what we talk about now.

A long time ago, when I was working on a series of videos to look into the future of communication, I was mentored about the democratization of technology. In fact, I was taken to task to make certain that I did not engage anyone in the creation of these videos who did not understand "the reality" and importance of such probing into where we were going. It was pointed out to me, that legislators in our world needed to view serious perspectives on where technology and social knowledge were headed. That, in fact, they may have little insight when creating regulatory laws. They needed to question their own assumptions to truly understand how technology affects the most fundamental needs of our lives.

It was 1990 when I worked on these films. At that time, it was very difficult for such technical references to appear plausible on screen. Problems occurred such as showing a future computer screen on film, which was almost impossible without waving lines and looking like an old science fiction movie. There was one guy who had developed a technology to overcome this. He was jurisdictional, a control type, and really annoying. We were focusing on future problem solving (in 1990 and projecting beyond 2010) on issues such as surgeons confronting sudden and new problems while operating. It is fascinating to look back and see these films, forecasting doctors using video casting or IM to find expertise during a critical moment in a surgery. Medical professionals, speeding up diagnosis based on accurate history through electronic medical records, as opposed to taking time to ask the same questions of patients over and over again.

Getting this cinematic challenge accomplished required the expertise of this one very difficult person who could actually make the picture look plausible. The irony about describing the future of collaboration and needing the skill of someone who had no interest in collaborating was a working reality that was very frustrating.

Social Knowledge Sharing Is a Way of Constantly Preparing

Now, we have many ways to collaborate and alternatives to move beyond such single control from one person or entity as I experienced in making the future view films. Yet, are we truly ready for the help that technology represents? Terms such as “continuous improvement” sound businesslike but they can also sound exhausting unless we understand that technology alone does not accomplish very much.

One major hospital in London just removed all their investment in an electronic medical system.

“I have personally apologized for the decision to implement the system before we were really clear about what we were going to receive...I had been led to believe it would all work.” - Andrew Way, the chief executive of the Royal Free Hospital, London, U.K.

What they did not prepare for was the social interaction and cultural change needed to actually make it work. Unfortunately, the guy who controlled the technology to make the future films look credible also controlled the schedule, budget, and the overall impression of the work. That’s reality not unlike the jurisdictional behaviors and realities we experience in business, art, education, and science.

CONCLUSION

We Invite You to Join Our Conversation: Here are Three Simple Questions to Begin

We commit to this conversation and trust that many of you will as well. Reality is dependent on what we care about.

1. How do you define the term *social knowledge*?
2. Do you have a story or know of one where you had to question the assumptions of what you were hearing or reading?
3. What is it you see developing for us through social knowledge sharing that’s really part of our everyday lives?

Visit www.conversationsforliving.com to engage in our conversation.

REFERENCES

- Abley, M. (2005). *Spoken Here: Travels among threatened languages*. New York: First Mariner Books.
- Anderson, N. (2009, October 11). *100 years of big content among fearing technology -- in its own words*. Retrieved December 1, 2009, from Arstechnica website: <http://arstechnica.com/tech-policy/news/2009/10/100-years-of-big-content-fearing-technologyin-its-own-words.ars>
- Baumann, P. (2010, March 28). Do pharmaceutical companies have social media anxiety disorder? Retrieved April 9, 2010, from Better Health: <http://getbetterhealth.com/do-pharmaceutical-companies-have-social-media-anxiety-disorder/2010.03.28>
- Berry, C. (2008). *Word to Play: A textual handbook for actors and directors*. London: Oberon Books.
- Brown, J. S., & Duguid, P. (2000). *The social life of information*. Boston, MA: Harvard Business Press.
- Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Chatti, M. A., Klamma, R., Jarke, M., & Naeve, A. (2007). The Web 2.0 Driven SECI Model Based Learning Process. In. *Proceedings of ICALT, 2007*, 780–782.

- Craik, K. (1943). *The nature of explanation*. London: Cambridge University Press.
- Douma, C. (2006, October 1). What Is Radical Trust? Retrieved from November 1, 2009, from Radical Trust website: <http://www.radicaltrust.ca/about/>
- Eyesight. (2009). *Wikipedia*. Retrieved (2010, April 18) from <http://en.wikipedia.org/wiki/Eyesight>
- Frantova, E., & Bergler, S. (2009, September 1). Automatic emotion annotation of dream diaries. In *Proceedings of the Fifth International Conference on Knowledge. Proceedings of K Cap Workshop: Analyzing Social Media to Represent Collective Knowledge*.
- Fuller, S. (1987). On regulating what is known: A way to social epistemology. *Synthese*, 73(1), 145–183. doi:10.1007/BF00485445
- Gardner, H. (2005). Multiple Lenses on the Mind. Paper presented at the ExpoGestion Conference, Bogota Colombia, May 25, 2005.
- Garelli, S. (2008). Retrieved from <http://www.imd.ch/>
- Gergen, K. J. (1991). *The saturated self: Dilemmas of identity in contemporary life*. New York: Basic Books.
- Gibran, K. (1923). *The prophet*. New York: Alfred A. Knopf.
- Goldman, A. I. (1986). The Cognitive and Social Sides of Epistemology. In *PSA. Proceedings of the Biennial Meeting of the Philosophy of Science Association*, 2, 295–311.
- Gordon, J., Van Durme, B., & Schubert, L. (2009). Weblogs as a source for extracting general world knowledge. International Conference on Knowledge Capture archive. In *Proceedings of the Fifth International Conference on Knowledge. Poster session* (pp. 185-186).
- Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Media International*, 46(1), 3–16. doi:10.1080/09523980802588626
- Gurteen, D. (1998). Knowledge, creativity, and innovation. *Journal of Knowledge Management*, 2(1), 5–13. doi:10.1108/13673279810800744
- Hakki, C., Cankaya, H. C., & Moldovan, D. (2009). Method for extracting commonsense knowledge. International Conference on Knowledge Capture archive. In *Proceedings of the Fifth International Conference on Knowledge, Session* (pp. 57-64).
- Heidegger, M. (1962). *Being and time*. New York: Harper & Row.
- Heuer, C. (2007, February 28). *What is Social Media? No, really, WTF?* *Social Media Club*. Retrieved March 24, 2008, from Social Media Club website: <http://www2.socialmediacub.org/2007/02/28/what-is-social-media-no-really-wtf/>
- Malone, T. W. (2006). What is collective intelligence and what will we do about it? Retrieved November 10, 2009, from MIT Center for Collective Intelligence website: <http://cci.mit.edu/about/MaloneLaunchRemarks.html>
- Manovich, L. (2009). The practice of everyday (media) life: From mass consumption to mass cultural production? *Critical Inquiry*, 35(2), 319–331. doi:10.1086/596645
- Ong, W. J. (2002). *Orality and literacy: The technologizing of the word*. New York: Routledge Taylor & Francis Group.
- Papadopoulos, S., Kompatsiaris, Y., & Vakali, A. (2009, September 1). Leveraging Collective Intelligence through Community Detection in Tag Networks. In *Proceedings of K Cap workshop Analyzing Social Media to Represent Collective Knowledge*.

Challenging our Assumptions

Peña-López, I. (2009). Digital Competences (VI). Joan Torrent: Electronic skill-biased technological change (e-SBTC), enterprise and work. In *ICTlogy*, #70, July 2009. Barcelona: ICTlogy. Retrieved October 15, 2009, website from <http://ictlogy.net/review/?p=2538>

Pentland, A. (2008). Understanding 'honest signals' in business. *MIT Sloan Management Review*, 50(1), 70–75.

Rasa, S., & Budlong, S. (Producer/Director). (1997). *Where Words Prevail*. [Web]. Retrieved from <http://www.wherewordsprevail.com>

Snowden, D. (2002). Complex acts of knowing: Paradox and descriptive self awareness. *Journal of Knowledge Management*, 6(2), 100–111. doi:10.1108/13673270210424639

Tschannen-Moran, M., & Hoy, W. K. (2000). A multidisciplinary analysis of the nature, meaning, and measurement of trust. *Review of Educational Research*, 70, 547–593.

Willis, P. (2001). The 'thing themselves' in phenomenology. *Indo-Pacific Journal of Phenomenology*, 1(1), 1–14.

ADDITIONAL READING

Donath, J. (2008). Signals in social supernets. *Journal of Computer-Mediated Communication*, 13, 231–251. doi:10.1111/j.1083-6101.2007.00394.x

Fushe, J. A. (2009). The meaning structure of social networks. *Sociological Theory*, 27(1), 51–73. doi:10.1111/j.1467-9558.2009.00338.x

Jenkins, H., Clinton, K., Purushotma, R., Robison, A. J., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Chicago, IL: The MacArthur Foundation.

Kock, N. (2005). What is e-collaboration? *International Journal of e-Collaboration*, 1(1), i–vii.

McAfee, A. P. (2006). Enterprise 2.0: The dawn of emergent collaboration. *MIT Sloan Management Review*, 47(3), 21–28.

Mergel, I., & Lazer, D. (2008). Lending a helping hand: Voluntary engagement in knowledge sharing. *International Journal of Learning and Change*, 3(1), 5–22. doi:10.1504/IJLC.2008.018865

Scanfeld, D., Scanfeld, V., & Larson, E. L. (2010). Dissemination of health information through social networks: twitter and antibiotics. *American Journal of Infection Control*, 38(3), 182–188. doi:10.1016/j.ajic.2009.11.004

Watson, K., & Harper, C. (2008). Supporting Knowledge Creation: Using Wikis for Group Collaboration (Research Bulletin, Issue 3). Boulder, CO: Educause Center for Applied Research. Available from www.educause.edu/ecar

KEY TERMS AND DEFINITIONS

Asynchronous Communication: Text messages delivered via the Web that are independent of time or place, allowing them to be received, read and replied to at the convenience of the reader. Some typical asynchronous communication tools are email lists, chat boards, blogs/micro-blogs, wikis and forums.

Blogs: Websites, generally designed in journal format, with most recent items at the top of a page, and written in a conversational, personal style, giving the author an authentic voice online. The items of content, such as text, photos, video, audio, have URLs plus other ways of identifying them by keywords - known as tags. Blogs can offer readers the opportunity to comment on, and link to items.

Collective Intelligence: The capacity of a community of people to evolve toward higher

order complex thinking, problem-solving and integration as the result of collaboration and innovation. Tom Atlee and George Pór have emphasized significance of human interaction as core to this process.

Community of Practice (CoP): A group of people who have an interest in, and vocational or avocational involvement in, a field, and who share experiences and insights within the group, learn from one another, and grow personally and professionally from the relationship.

Creative Commons: Options which authors use to publish their work, allowing various permissions to users to copy, distribute, display and/or perform their copyrighted work by designating the level of license associated with their intellectual or creative property (available at <http://creativecommons.org/about/licenses/>).

Gangs 2.0: *KTLA* News. 12:44 PM PST, November 19, 2009, “The Emerging Threat of Cyberthugs”

Integrated Supply Chain of Trust: Understanding accountability as a shared responsibility.

Open Source Technology: This approach to the development and sharing of technology provides access to the source code of software allowing developers outside the originating organization to alter and share the original application. In many instances, Open Source Technology is available as Freeware that is available at no cost to download from the Internet.

Social Media: The Web-based and mobile technologies that are designed for the real-time and asynchronous social interaction and creation of user-creations of content, such as sharing of digital content, communication and collaboration, by identified users as members of communities.

Web 2.0: A term (attributed to Tim O’Reilly, 2004) that refers to online applications that allow interactive design of the graphical interface, information sharing, and collaboration on the World Wide Web. Examples of these technologies include Web-based communities, hosted services, Web applications, social-networking sites, podcast and video-sharing sites, wikis, blogs, mashups and folksonomies.

Chapter 4

Social Knowledge Case Study: Innovation Linked to the Collaborative Socialization of Knowledge

Cindy Gordon

Helix Commerce International Inc., Canada

ABSTRACT

The premise of this chapter is that Innovation Growth is tightly tied to the collaborative process of socializing knowledge. Case examples from leading companies leading the way in socializing knowledge leading practices will be profiled. These companies will be a mix of new stories from a mix of both profit and not for profit organizations, in a mix of industries. The leaders of these organizations recognize that the socialization process of knowledge is core key to innovation growth. This chapter tells the story of change agents that are helping to move from vision to execution successfully. You will hear of experiences where the full enablement of their programs are not fully funded, or necessarily aligned across all levels of management where the generational gaps between understanding community and value network networks vs those based on linear “one way flow” models continue to conflict with one another; The case studies all started off with a small project well scoped and defined, and organically evolved vs a big bang approach. Each of these cases is rooted in a clear business need either for employee engagement or customer engagement needs.

INTRODUCTION

Increasingly executives realize that innovation is rooted in the health of their corporate culture, and is evidenced in their business practices, cultural behaviors, and norms which either foster open

collaboration and knowledge sharing or stifle these trust building and risk taking competencies.

Never before has collaboration and innovation been so important to an organization’s survival. As the war for talent intensifies, Generation X and Y’s will become increasingly sought after talent pools. They have more choices for employment than any other generation in the past due to the rapidly retiring Baby Boomers. They will join

DOI: 10.4018/978-1-60960-203-1.ch004

organizations that enable them to communicate and interact using social mediated and collaborative technologies to perform their job functions.

They will live by the “law of two feet” as their loyalty mantra in an organization is either “*let me be empowered to collaborate using next generation collaboration solutions or I will leave to an organization that has these investments in place.*” The millennials loyalty is based on being part of a cohesive and community generating culture that is stimulating and fun to work in provides a rich interactive learning environment, and balances business and social responsibilities.

What we know from our Helix Commerce International Inc. (www.helixcommerce.com) research is that for organization’s to successfully compete in the new Knowledge Economy that ease of access to collaborative social mediated technologies that improve knowledge worker productivity will be a key success factor to attract, develop and retain talent.

Currently, the majority of Fortune 500 organizations are just starting to recognize the importance of applying Web 2.0 and collaborative solutions to their business processes. Web 2.0 technologies such as: blogs, micro blogs, podcasting, social mediated technologies, virtual worlds and wikis are now being rapidly applied in innovative ways to improve business practices.

DEFINING COLLABORATION

Collaboration Defined

“In the long history of humankind (and animal kind) those who learned to collaborate and improvise most effectively have prevailed.”

Charles Darwin

Collaboration refers to the business process of bringing together a group of people to work together or the act of working jointly. It usually

occurs when two or more people interact and exchange knowledge in the pursuit of a shared collective goal.

A recent IBM international survey of 765 CEOs confirmed that practically all CEO’s will say they are for collaboration and for radically shaking up their business models to increase their innovation speed. Yet, when asked how their organizations are accomplishing collaboration for the purpose of innovation, they rank their ability to collaborate effectively in emerging markets at 73%, global markets at 51%, and in mature markets only 47%.

Collaboration requires an aligned business strategy where knowledge assets are valued to increase innovation and achieve competitive advantage. It also requires an understanding that cultural behavior, work process and appropriate technology capabilities need to be aligned to evolve an organizational culture’s collaboration values and competencies. Developing a healthy and effective collaboration capability in an organization requires a number of success factors:

- **Culture** - A culture that encourages authenticity, teamwork, cooperation, trust-making, openness, transparency, networking, social responsibility and risk-taking will have healthier collaboration execution capabilities. It is well proven that organizations are able to innovate more successfully to sustain competitive advantage with collaborative core values.
- **Process** – Organizations that embed collaborative business models and trust sense-making approaches into core business processes and practices increase knowledge worker productivity and improve organizational intelligence. This dynamic and iterative learning process design provides more learning loops for knowledge exchange, and more rapid continuous improvement opportunities.
- **Organization** – Companies that invest in collaboration and knowledge worker in-

novation and productivity strategies that also have an overall organizational competency roadmap to integrate collaborative capabilities to improve their innovation and growth capabilities. Key competencies include Talent Management Life Cycles (Attract, Develop, and Retain) and new Employee Engagement Practices for more open and double loop learning and communication strategies.

- **Technology** – The last ten years collaborative technology capabilities have rapidly evolved from simple email to rich social and multi-media toolkits delivered by alternative access devices (web, mobile, etc).

What is unfolding is a fundamental business and economic shift where the power is shifting to the external markets vs. the internal markets of firms. This is what we refer to as collaboration commerce or c-commerce which is a combination of disruptive and collaboration business models that integrate new mind sets, values, and technologies to achieve higher levels of collaboration, and innovation among individuals, firms and nations.

This phenomenon is often referred to as “*Collective Intelligence*,” or “*Crowd Sourcing*,” where the wisdom comes from the diverse web based crowds that value rich social mediated conversation. It is this rich interactive communication dynamic that accelerates the increased desire and willingness of stakeholders to contribute their intelligence more freely which allows others to have access to additional “know-how.”

The knowledge exchange rates are now at ones fingertips on the world-wide web as knowledge is increasingly outside the firm vs. inside the firm. Most knowledge is now obsolete world-wide in the majority of industries in less than a year further driving the reality to life-long learning approaches in developing a nation’s productivity.

COLLABORATION TECHNOLOGIES AND LINKAGES TO WEB 2.0

Simply defined, Web 2.0 is a term given to a collection of new digital platforms based on social computing which is used for generating, sharing and refining information. There has been a continual evolution of Web solutions since the early Web 1.0 solutions were introduced from companies like AOL, eBay, and Yahoo.

The next generation of social computing solutions now dubbed Web 2.0 or often referred to as social computing refers to the use of Social Software, a growing trend in Information Technology (IT) usage of tools that support social and community interaction. Web 2.0 represents the third wave of collaboration that enables people to meet, connect or collaborate through computer-mediated communication and to form online communities. Often the term Enterprise 2.0 is used in relationship to Web 2.0 – fundamentally Enterprise 2.0 is the application of these tools to companies or between companies. Frequently discussed capabilities of innovative and collaborative Web 2.0 platforms include:

- The ability to increase the funnel of new service ideas through collaboration internally (among employees) and externally (with strategic partners, software developers and subscribers);
- The organization of ideas with a documented process for requirements capture and portfolio management;
- A reduction in the cost of innovation by providing a low-friction, cost-effective environment for collaboration;
- An opportunity to validate market assumptions prior to the significant investments required for commercial launch;
- Price experimentation to determine customer willingness to pay for new services; and

- An environment for an iterative approach to services innovation – start with an idea, test its feasibility with customers, launch a market trial, capture customer feedback, implement enhancements, and launch again until confidence in commercial success is high

Table 1 provides a summary of Collaboration Web 2.0 Solutions and a perspective on their evolution in business. To attract Generation X and Y's and to take advantage of lower cost enterprise Software as a Service solution platforms developed on Web 2.0, organizations will need to develop an intensified collaboration strategy and execution model for competitive advantage.

WEB 2.0: COLLABORATION CASES

This section will provide a number of cases demonstrating innovative approaches using diverse collaboration technologies using different solutions and platforms. Web 2.0 areas discussed in

Table 1. Collaboration Web 2.0 growth trends

Wave 1	Wave 2	Wave 3
E-Mail	Virtual Work-Spaces	Blogs
Calendar	Instant Messaging	Wikis
Group Scheduling	Enterprise Portals	RSS Feeds
Discussion Forums	Presence	Social Networks
Directories (Taxonomies)	Web -Conferencing	Tagging
GroupWare	Expertise Automation	Social Bookmarking
	Personal Websites	Personal Profiles
	Composite Applications	Mash-Ups
		Podcasting
		Virtual Metaverses
		Collaboration Stories

this section will include: blogs, podcasting, social media technologies, wikis, and virtual worlds. Each category will be briefly defined, and then followed by a short caselet.

Blog Defined

A blog is journal-style website that expresses an individual's view. It takes no technical skill to run a blog – the user just fills in a web form, selects categories and posts. It provides a transparent searchable archive of the blogger's content and links to other's contents within a meaningful context.

Blog Cases

- **General Motors** – (www.gmblogs.com) – GMblogs.com is general Motor's home for corporate blogs. GM has taken an aggregation approach to bringing all their corporate blogs into a centralized blogging presence to ensure branding and unified blogging to the external market is branded effectively. As of fall 2008, they have four major blogging sites: Fast Lane Blog which blogs about cars and trucks and discusses all aspects of Ford Vehicles and encourages community interaction. They also have a General blog called FYIgmblogs.com which is a blog that centralizes GM news, information and opinions across all their global business units. It is written by GM employees and they are encouraged to blog. The third is focused on a community blog for Cadillac drivers to interact with customer's real time and obtain feedback to help evolve products and services of Cadillac customers. The more recent blog is GM Tuners Source website which provides news updates, picture galleries from racing and drifting events captured from around the country. It includes driver profiles, tuner accessories and building books.

Social Knowledge Case Study

- **IBM** -IBM has taken a strong leadership position in demonstrating the value and possibilities of adopting social media technologies. IBM Blogs Central gives every IBM employee a platform to publish and discuss his or her ideas openly and to collect feedback. The platform hosts more than 12,000 individual blogs and 1,000 group blogs. BlogCentral featured 105,000 entries with 106,000 comments and over 25,000 distinct tags as of early 2009.
- **ING Direct** – The Canadian division of ING Direct has a next generational CEO, Peter Aceto that is active micro-blogger and uses Twitter daily mixing both business news and professional dialogue. With over 3,000 followers, Peter's tweets share the day in the life of a committed CEO leader to business, his family and his community. He is visible 7x24 whether it is letting us know he is in a board meeting or at a birthday party for his daughter. In a recent discussion with Peter, he indicated he is not always sure about mixing business and personal life tweets on his daily activities. However, we believe he is simply a generation ahead of most of the CEO's in the retail banking industry as he understands not only the psyche of openness and transparency, he has incredible passion for the community and making the world a better and simpler place to develop in. Finding open learning leaders like Peter are very difficult to find in life; with his legal degree underpinnings, this young CEO has much to teach the world about the value of social mediated conversations. He is tapped into the community and every day sees or hears something that helps ING Direct Canada stay connected, and offers a unique branded experience that sets them apart from traditional tier one NA banks.
- **Oracle** – Oracle is in the business of helping clients manage business information securely and effectively and are using Web 2.0 solutions to help them deliver on their mission. Oracle bloggers use their platforms to communicate both internally and externally about the strategic direction and product development. The company's legal team does occasional spot checks on the external blogs run by senior executives. Oracle uses a simple policy for blogging and using social media tools in general which is: do not say anything you would not want to be attributed to you, and don't give out secrets or confidential information. Oracle's legal confidentiality policies and employee handbook provide useful guidelines. Periodically legal review blogs entries more as a guidance function as Oracle's assumption is that people would not try to hurt the company explicitly, although they might do it by mistake.
- **MTS Allstream** – MTS Allstream is in the business of staying on the cutting edge of new communication technologies. Senior Manager of Social Media Marketing, Craig Brown, has been a key driving force at MTS leveraging blogs and social mediated ways of working. The company uses the Microsoft SharePoint platform to support open discussion through blogs on its intranet, and senior executives across the organization are actively leveraging blogs as effective communication channels. Their CEO of the MTS Enterprise business unit, Dean Prevost is a role model leader of social media and uses these tools to communicate more openly with employees and encourages his leadership team to interact more openly and socialize more transparently with employees at all levels. Craig Brown the Web 2.0 architect and change agent at MTS Allstream has made role model progress at MTS by being persistent with the need to evolve the organization's culture and take advantage of social

approaches. Most recently, their employee engagement scores have reached 80% employee satisfaction ratings, and a great deal of this is felt to be linked to their social media practices of ideation (Innovation using social approaches), discussion forums, blogs, wikis, etc. Key lessons learned at MTS include: get the legal issues sorted out early, start internally and get employees comfortable. Cultivate senior executives to be sponsors and get them involved. Help executives set up blogs and coach them one on one to make the transition, and don't be afraid to experiment.

- **World Bank** (<http://psdblog.worldbank.org>) – The World Bank's private sector blog gathers together news, resources, and ideas about the role of private enterprise in fighting poverty. The objective of the blog is to provide intelligent community comment on private sector development issues in the news, and provide an effective link between the detailed resources of the World Bank's Rapid Response website and the ever changing world of the blogosphere. The PSD Blog is maintained by the World Bank's Group Rapid Response Knowledge service, which specializes in policy advice on business environment reform and privatization policy in developing countries. Rapid Response is a joint initiative between the World Bank and the International Finance Corporation (IFC).

There are many other leading companies using blogging and also micro-blogging practices. A detailed case study of Molsons Canada is summarized at the end of this chapter. Based on our research in terms of complexity of multiple external customer facing websites, and customer communities linked to diverse brands, they are world-class, and have been recognized world-wide for their digital social media innovations.

Podcasting Defined

As Wikipedia defines it, “*A podcast is a digital media file, or a series of such files, that is distributed over the Internet using syndication feeds for playback on portable media players and personal computers.*”

Podcasting Cases

Outlined below are a number of innovative approaches to using podcasting from leading companies in the financial services market.

- **Bank of Nova Scotia** – are using podcasts in Retail Banking to bring expert perspectives to educate retail consumers on topics ranging from: Global Economic Reports, Helping parents to plan for University, perspectives on Small Business and The Canadian Economy, Getting the Value from your Bank Account. BNS also profiles senior BNS executives to discuss perspectives on retail banking, mortgages, and community. See: http://www.scotiabank.com/cda/content/0,1608,CID10842_LIDen,00.
- **Reuter News** – has a web casting service that features diverse pod casts to listen and often interact with experts on topics ranging from: Entertainment, Finance and News, Sports, etc.
- **World Bank** – has a webcasting service called B-SPAN. B-SPAN is the web podcasting service of the World Bank Group, presenting seminars, workshops and conferences on a variety of sustainable development and poverty reduction issues via streaming video. The World Bank and its partners play host to numerous seminars, workshops and conferences where the world's leading development experts and practitioners discuss the latest developments in a range of sectors, including agriculture, sustainable development, finance,

Social Knowledge Case Study

poverty reduction, health, education, governance, environment, energy, infrastructure, rural and urban development, and more. B-SPAN webcasts are free to view. World Bank staff, academics, students, researchers, journalists, NGO representatives, and members of the public-at-large can virtually “attend” events from anywhere in the world where the Internet is accessible. By bringing World Bank events to the computer screen, B-SPAN is an invaluable podcasting tool for the World Bank’s missions of promoting transparency and sharing knowledge. (See: <http://info.worldbank.org/etools/BSPAN/index.asp>)

Social Mediated Technologies Defined

Social Mediated Technologies epitomize Web 2.0 innovations as they focus on easily integrating multiple communication mediums, words, pictures, podcasts, videos, IM, blogs all come to create new conversations and enable community building opportunities. The most popular solutions include: Facebook (social communities), Flickr (photo sharing) MySpace (social communities) Second Life (Virtual worlds) and YouTube (video /community sharing).

Social Media Technology Cases

- IBM uses a number of innovative approaches to using social networking tools. The BlueIQ Ambassadors program encourages IBM employees to help each other use social software more effectively. Social Software Jumpstart consulting helps client-facing teams take advantage of social media to improve their productivity and effectiveness. Employees have access to IBM BluePages which give individuals a place to share their expertise and inter-

ests. Cattail File sharing technology also helps them to eliminate duplication of effort by allowing employees to share presentation slides and other materials as well as enabling others to subscribe to updates of existing files. Lotus Quickr supports team collaboration both inside and outside the IBM firewall. IBM communities hosts more than 900 communities, include 300 private companies.

- Toronto Dominion Bank - Setting their sights on social media optimization, TD Bank launched a Money Lounge solution on Facebook in August 13, 2007. The initiative was a six month pilot project with the goal of attaining 10,000 members, or fans. Within ten days, 3,000 new fans were generated. Their goal was exceeded with 11,000 fans added by the end of the six month preliminary period. Thirty-nine percent of Facebook’s 40 million users are between the ages of 18-24 years old and four million of the site’s total users are from Canada. The Money Lounge is directed at students aged 24-35 years, motivated by the expectation that a majority of this demographic will enter the workforce and grow their banking needs in the coming years. TD has generated interest in the Money Lounge with campus bus tours, word of mouth and viral marketing campaigns, in addition to banner advertisements on Facebook. The Money Lounge is a collaborative community that fosters discussion between TD, employees, and customers about finance and budgeting. Services in the Money Lounge include Split It, a calculating tool that helps roommates divide their bills. In the first phase of development fans of the Money Lounge had access to coupons from major retailers; iTunes, Empire Theatres, Best Buy, Roots, and Zellers. In the beginning of the second phase TD introduced their environmental

initiative to the web by promising to donate \$1 to TD Friends of the Environment for every Facebook user who referred a friend. The Money Lounge has been a lesson in learning to adapt to uncontrolled communication exchanges, a staple of any social networking site. Sue McVey, Former Vice President of TD Customer Segments and Strategy says that they are using the Money Lounge to learn how to interact with students in their own environment. *“This is about understanding this media and how we’re going to interact within it. Where we’re really learning is in the dialogue...and how often in have to go in and out. Nobody’s got it mapped out.”* By the fall of 2009 TD Bank had over 60,000 users registered on its Money Lounge and investments continue to be made.

- Circle Lending - Launched in 2001, CircleLending is a widely regarded as a trailblazer in Web 2.0 Social Peer Lending in the financial services. Circle Lending has effectively designed unique products that allow individuals to save money and keep wealth in the family by securing affordable loans from relatives and friends. Circle Lending has helped first-time homebuyers, entrepreneurs, students and other individual’s access credit at favorable terms. As of Summer, 2007, Virgin USA acquired a majority stake in Circle Lending, which was allowed Virgin USA to launch and white label new financial service offerings. The first Canadian company to enter into this business model foray is Community Lend after taking two years to achieve regulatory approvals.
- Pertuity Direct.com – Pertuity Direct is a social media solution which provides consumers’ with the most useful financial information transparent and available to you, and to provide access to unbiased financial tools and options. They strive

to make the best deposit and credit card deals across the country available to you, ultimately saving you money. They offer wealth management experience and expertise to help consumers make the best possible financial decisions. They do this with no strings attached - there’s no cross selling; no prequalification; no sales pitches; no minimum balances; no fees. The model is an advertizing based model and provides quality services like financial advisors in retail banking or wealth management provide supported by the intelligence and “Wisdom of the Crowds.”

Virtual Worlds Defined

A virtual world is a computer based simulated environment, intended for its users to inhabit and interact via avatars (simulated people). The environment is represented in two or three dimensions, and three dimensional virtual worlds are becoming the popular norm. Gartner predicts 80% of active Internet users will have an avatar in the virtual world by the end of 2011.

Virtual World Cases

Although in its early days, virtual worlds provide a 3D visualization experience on the web using avatars for preferred methods of interacting. The most visible Virtual World testing these new frontiers is Second Life, which has already attracted over 300 of the world’s tier one brands like: CNN, General Motors, IBM, Microsoft, Nike, Nissan, Vodofone etc. Outlined in this next section is a summary of the most successful brand experiences in Second Life, based on Helix Commerce global research analyzing over 300 SL sites. The two year comprehensive research report is available by contacting www.helixvirtualworlds.com. This section below is extracted from the Helix Research report (2009). The Research report is available at <http://stores.lulu.com/helixcommerce>. The

Social Knowledge Case Study

majority of these virtual world examples are from leading financial service organizations, primarily from Asia and Europe.

- **BCV Switzerland Bank** – This is the first Swiss Bank to enter SL. They have two Sims that are showcasing their products and services. They are also providing virtual land for local businesses to promote a French Speaking community. On BCV's island, there is a large, building surrounded by lush digital greenery with floating lights. The landscape is richly detailed and can be explored by the curious avatar. The main building consists of two floors. The first is home to a series of information boards outlining BCV's products and services. The second floor houses a selection of representations of works of art from BCV's collection in Switzerland. BCV does not actually offer any financial services in Second Life yet. On the second Sim, dedicated to the French language, is a collection of SL stores selling things from furniture to clothing. There is also a virtual spa and an area for one's avatar to meditate.
- **ING** – ING initially took the virtual world seriously with its ING's virtual Holland project is with international partners, clients and inhabitants of SL. It was designed as a hot spot for virtual tourists & Business people from all over the world. It had beautiful Dutch Architecture landscapes, tulips and has been designed as a special place to relax and enjoy. ING also opened up a large part of its renowned art collection to the public in an outstanding building on Virtual Holland. ING departed Second Life virtual world nearly two years ago, but their initial footprint was ahead of the industry's vision of what the future of retail banking could look like in our future. VISA Europe is asking users for suggestions

as to what Visa should build on its land. It is also taking advice on what to build from banks in its network. ING's goal in Virtual Holland was to seek insights from customers, partners and inhabitants of the Virtual Island on the products and services it should offer. I expect in time it will be back but likely under its new Retail Café brand in developing online communities connected to real life experiences.

- **Kraft Foods** – Kraft Foods is leveraging Second Life launched and showcased 70 new products as part of its sales pitch to retailers at the annual industry convention, the Food Marketing Institute Show in late 2007, and have continued to profile **“Phil's Supermarket,”** named for TV's “Supermarket Guru” Phil Lempert, food editor for the “Today Show.”

Lisa Gibbons, Kraft spokesperson said, “This non-traditional effort illustrates how we're changing the way we market our products to build brand equity and remain relevant to our key customers.” Visitors today can watch cooking videos of specific Kraft products, and participate in community demonstrations with key chefs, providing another opportunity to collaborate with customers, and create new community highly immersive experiences.

In summary, these examples illustrate tremendous opportunities for organizations that have the vision to understand that the Web 2.0 and 3D virtualization economy is rapidly evolving and the time to enter is “now.”

Wiki Defined

What is a wiki? According to wikipedia – “the free encyclopedia that anyone can edit” (<http://en.wikipedia.org>), “(a) wiki is a type of website that allows anyone visiting the site to add, to remove, or otherwise to edit all content, very quickly and easily, sometimes without the need for registration.”

Wiki Cases

- **Bank of America** uses the Confluence wiki to support their investment banking practices. “The ability to store information in context – to weave a narrative through data sources, attachments, charts, archived mails, and other data – is what makes wikis a powerful knowledge management tool”, says Michael Ogrinz, Software Architect at Bank of America, one of the wiki leaders. Traditional document management software works like a giant filing cabinet where it’s hard to tell what information is important.”
- **British Telecom** – British Telecom have been active wiki users for the last year to improve employee communication and productivity levels. They currently have over 300 internal employee wikis. BT have been using wikis since 2006 and in a variety of applications, ranging from IT support to new product development and technical support conversations with customers. The main benefit of social computing technology BT has experienced in their wiki solutions is the elimination of reliance on one or two experts to solve problems. Social computing has many applications across organizations, and should be used with the existing communication infrastructure. In BT’s latest program deployment phase, all BT employees will be using wikis across the organization www in the next couple of years.
- **Citibank** –Citibank picked up on the wiki trend in 2004 and formally deployed Atlassian’s Confluence in October 2005. Citibank are typical, as they started from the need to rapidly deploy internal-customer-facing material. Gone is the long-publishing cycle to check static content before it goes out: customers or employees are trusted with the power to directly change content in real-time.
- **CommSecure** in Australia makes e-business solutions that are installed over much of the world, with 24 x 7 support. They use a wiki internally to track the current status of each installation, as well as to document procedures for handling alerts, solutions to new problems, changes in contact information, etc. The wiki is easily updatable and everyone is encouraged to contribute if they have new information. If the answers are in more formal documentation, the wiki serves as the index to that documentation, which saves people in an emergency having to wade through several different sets of documentation provided by third party organizations trying to find the one vital piece of information to solve this particular problem.
- **Family Health International** uses wikis in their not for profit organization fighting AIDS to bring their research scientists together around the world to work on HIV research projects, link up sales resources to share best practices, and support training program needs.
- **MTS Allstream** uses wikis to support their marketing and sales internal practices. As well the CEO for their Enterprise Group frequently uses wiki like discussion forums to increase employee communication and engagement practices.
- **Novell** uses wikis to support collaboration and encourage conversations in a variety of ways, both within teams and across their enterprise that operates on a global basis, and the wiki is “just part of work now”
- **MIT’s Sloan School’s** CIO has used a wiki together with a blog to support strategic planning, reducing circle time and increasing staff buy-in.
- **Pixar** uses wikis for film production, software development, and internal IT. It be-

Social Knowledge Case Study

gan in IT but spread into the other areas. In film production, skills and technologies are so specialized, Pixar has used Confluence for knowledge sharing and learning.

In summary, Wikis provides a new management practice to help increase mature markets capability to innovate more successfully as wikis provide the space to incubate ideas. Yet, to date, wikis have largely been a grassroots phenomena. Few senior executives have used a wiki, or are embracing collaboration patterns at the speed required for competitive advantage. Those firms that first embrace the architecture of wiki participation will be at a distinct advantage.

DETAILED CASE STUDY – MOLSON COORS

Molson Coors Brewing Company (TSX: TPX.B; NYSE: TAP) is a company that was created by the merger of two of North America's largest breweries: Molson of Canada, and Coors of the United States. According to the Molson Coors website, Molson Coors Brewing Company is the fifth-largest brewer by volume. As an organizational culture, Molson Coors has a values driven culture. Corporate responsibility is deeply rooted in their heritage, and it is more than just a program; it is a foundation that drives Molson's business practices.

Therefore, it made sense that Molson Coors in Canada elected to enter the social media space through a corporate group blog, focusing on the community. The blog offered the company the opportunity to build an online Molson community, and integrate their two key objectives: To serve the public through philanthropy and to establish a channel for telling the Molson story.

The challenge Molson faced in embracing social media was that it required a fundamental organizational transformation in communication with internal and external stakeholders. After

an initial unsuccessful launch in 2007, Molson Coors Canada re-launched their corporate blog in February 2008. Molson's overall Web 2.0 communications strategy focuses on the blog and the community that follows.

All evidence points to Molson's success with their social media communications efforts. By May 2009, Molson had a following of 18,000 on the blog, over 5,200 on Twitter, 70,000 fans on their Facebook sites, and a database of 1,200,000 subscribers. Through the ongoing experimentation and learning, Molson achieved a level of sophistication in their use and application of social media tools and channels. Their success in executing social media programs illustrates the company's proficiency in applying the communication and blog best practices. Molson uses social media monitoring tools to gauge performance, and measures success in terms of objectives, that are tracked against results. For Molson, ROI is a return on influence, not investment.

Culture and Values

The Molson Coors culture is rooted in their founders' values. Both Adolph Coors (1873) and John Molson (1786) were driven by passion and innovation and held a deep rooted commitment towards community, and the mastery of their craft. The company leverages these values for competitive differentiation, and building brand equity. The Molson Coors values define the culture and business practices, and underpin all of the company's communications.

The Molson Coors culture is one where people are united through "shared values, a passion for beer, and the strong brewing heritage". The cultural foundation is anchored on the six core values epitomized by the founders: Integrity, respect, quality, excelling, creativity, and passion. The company's vision, "to be a top performing global brewer winning through inspired employees and great brands", is achieved by "living" the company values."

Molson Coors communicates their culture, values, vision, and business practices through the tag line, “doing business the right way,” which translates to five company commitments: 1) Performance with integrity; 2) quality products marketed responsibly; 3) environmental stewardship; 4) value-guided investments; and 5) ethical and responsible sourcing

For Molson Coors, “doing business the right way” is synonymous with corporate responsibility, and substantiated through active involvement in charitable initiatives, sports, and entertainment sponsorships. Molson Coors treats corporate responsibility as a business practice, “not an ancillary project that can be set aside when other priorities arise.”

Corporate responsibility is one of the “four key foundations for our business success along with profitability, people development and engagement, and strategic brand growth.”

Molson Coors communicates their culture, values and business ethics on their website, in their Annual Report, in their Press Releases, and through their actions. They also validate their communications claims by measuring success through external recognition –number of awards received and third party metrics for benchmarking to global standards and for substantiating internal results.

Stakeholder Engagement

Molson Coors has wide range of stakeholder groups, the first of which is employees. Internally, Molson Coors “strives to both continually challenge and consistently reinvest in its people as passionate stewards of the brand”². Molson Coors defines the other five constituents as follows: Customers (independent distributors, channel partners such as pubs, restaurants and retail), consumers, communities, government (federal, provincial, and regulatory agencies), and interest groups (non-governmental organizations)³.

While the media is not a stakeholder group, they are an important influence group that Molson Coors also engages in their communications. Worth noting is that Molson treats stakeholders as a cluster group when using social media. The blog “community”, for example, encompasses NGOs, government, blogosphere influencers, and the public at large.⁴

Given the pervasiveness and opportunities with the emerging online capabilities, the Molson Coors Canadian operation was anxious to leverage social media and the new technologies, to build an online Molson community, and engage their core stakeholders in two-way conversation. Building the Molson community was a way for Molson Coors to listen and learn and in the process, strengthen their relationships, build brand equity, innovate, and sell more products.

From a social media perspective, there was also a desire to test and understand the new tools and channels, and get to know the influencers of the blogosphere. The Web 2.0 initiative held the potential of “breaking down turf conversations and setting up a model of collaboration”. Molson’s starting point was the launch of a corporate group blog in 2007, *Molson in the Community*.⁵

Trigger for Molsons Embracing Social Media

The trigger for Molson embracing social media was a post merger event. The company transformed the Molson Donations Fund and Community Investment portfolio from a monetary only contribution to new approaches in philanthropy. The shift put Molson “in touch with partners in the community and drove benefits beyond the passing of a cheque” When the “good news story” was passed over by traditional media, Ferg Devins, the Chief Public Affairs Officer saw an opportunity; he “insisted that Molson needed to be telling the story through a blog (Devins, 2009).” In 2007, Molson Coors began experimenting with social media tools. After the initial failed attempt at a

Social Knowledge Case Study

corporate group blog, Molson re-launched the blog in February 2008 with Ferg Devins as the Executive Sponsor.

Shortly thereafter in the same year, the company introduced multiple Molson Facebook sites, and Twitter. According to Ferg Devins, the initial blog attempt failed because “our first blog on the community was based on employee communication and was not embraced by the external community so it didn’t work. We re-launched in February 2008 with a broader community involvement. We took it from employee centric to how important what we are doing is for the community message.” The goal for the re-launch of the blog was to establish a platform “to tell the compelling Molson Community story (Devins, 2009).”

Ferg elaborates: “This story has been a cultural phenomenon for Molson since 1786...a story worth telling. Stories on the blog are ones that would not be picked up by traditional media –it’s an opportunity for Molson to tell their story; for the channel to talk about community, philanthropy, people (Devins, 2009).”

For Molson, public good (corporate responsibility) is motivated by a number of factors. First, it is part of the Molson Coors their heritage, inherited through their founders. Second, it is important to building brand equity, and as noted in the financial statements, changes in brand equity have a material impact on the company’s finances. Third, Molson operates in a highly regulated industry, hence, public perception and opinion is core to their business success. Fourth, since public good is part of the Molson Coors history, they are able to leverage community contributions to tell the Molson heritage story, and create a competitive differentiator in the process. For Molson, public good and selling beer go hand-in-hand, and this mindset is seamlessly integrated in their values and business practices.

Molson Coors faced a number of challenges in their transition to online communications and adoption of social media tools. The challenges are summarized below:

1. Prepare the Corporate culture for the transition from command and control communications to two-way conversations;
2. Learn and effectively apply social media best;
3. Select the tool sets and define the objectives for each;
4. Define new policies and practices for use of the social media tools;
5. Embrace the lack of censorship in social media while mitigating the potential risks to brand equity, and the company’s reputation.

The transition goal was to leverage the power of Web 2.0 social media but migrate in a way that enabled the company to prepare for the changes, and internalize the learning as it dynamically unfolded. The business objective was to build the Molson Coors community online, engage stakeholders in two-way conversation, and share the Molson story; the value-based heritage of a company that “does business the right way”.

SUMMARY

In many ways, the true measure of Molson’s communications success is in their evolution from a failed company blog in 2007 to a transformed social media organization in 2009. Ferg Devins, summarized this nicely when he said, “now we are all brought together into cohesive communication. It’s about having one to one communication with consumers and involving the brand staff. We are knocking down the silos” (Devins, 2009).

Molson’s communication transformation has fundamentally changed the conversations with both the internal and external stakeholders. Molson Coors Canada now has a clear understanding of the power behind social media, and has gained proficiency in the use of tools through program execution. They have listened, learned, understood, and stretched the boundaries further to embrace

a greater range of social media technologies, and use the channels more strategically.

Ferg summarizes the internal changes as, “now it’s simply the way we do business,” (Devins, 2009). Externally, Molson’s stakeholders have embraced them by subscribing to their database, participating in the two-way Tweets, forming a fan base on Facebook sites, and engaging on the blog. While there are still many opportunities for growth, Molson has clearly exhibited social media competence and Web 2.0 communications strength. Since the launch of the blog in 2008, many lessons have been learned, internalized, and leveraged for the evolution forward. The Molson story is making its way across the blogosphere and other social media channels, and more importantly, it is being embraced by thousands of their constituents.

JP MORGAN FACEBOOK COMMUNITY CASE STUDY

Building on the success of JP Morgan Chase +1 (almost 50 000 fans) (Facebook.com), JP Morgan developed a Facebook community. This application is developed by Noise Marketing New York targeted at Gen Y. Though not developed Facebook, JP Morgan Community has quickly gained recognition as one of the best applications to use the Facebook platform. As an interactive tool, JP Morgan Community utilizes the necessary stickiness components, such as video, interactive games, and discussion boards that enhance a user’s experience.

With the aid of an external marketing agency and the marketing department at JPMorgan, the JP Morgan Community is born. Its main function is to enable easing of communicating with JPMorgan’s employees and recruitment teams. It visually and interactively enhances the user’s experience by allowing access to all aspects of JP Morgan both professionally and socially. This transparency of the recruitment possibilities within JP Morgan

allows the user to easily identify which business areas are of interest and the ones, which are not.

Why Facebook?

The easy accessibility of Facebook to both candidates as well as JP Morgan’s recruitment teams. As a global organization with a global reach, JP Morgan needs a global reach platform to attract the best and brightest irrespective of location. Facebook provides JP Morgan with the ability to easily operate out of their central hub while accessing their regional hubs in Europe and Asia-Pacific as well.

As Facebook’s roots lie in the university target market there is an opportunity to connect and create relationships with the Gen Y’s through a corporate lens. By leveraging the reach of Facebook, JP Morgan is positioning itself as a market leader in terms of connecting with the Gen Y’s. Most global organizations realize the value in investing in younger talent and JP Morgan is doing the same, not on their own terms but those of the target market.

Features

One of the great aspects of JP Morgan community is that the features provide relevancy to and interaction with potential candidates. With potential new hires engaged, there are learning opportunities for both parties involved. JP Morgan employs all forms of rich interactive media to engage potential recruits. JP Morgan utilizes video, podcast, photos, and PDF to inform the candidates about the corporate culture. The use of video is employed to demonstrate the daily tasks of a *trader* to the securing of a mandate for an upcoming IPO. This information is detailed to allow for a better understanding of what type of individuals are best suited for particular areas of the business. Not only does this give greater transparency to JP Morgan by enlisting actual employees, but this also gives candidates a clearer indication of where their strengths may lie.

Social Knowledge Case Study

Aside from using video to determine a professional fit, the use of photos gives a clearer insight into JP Morgan's commitment to teamwork and camaraderie in a social setting. Through the display of events from a summer boat cruise to a women's networking opportunity, JP Morgan incorporates the social sphere in a corporate manner recognizing the importance that Gen Y's place on working hard in both professional and social environments.

The attractiveness of this feature is the invaluable information that is presented in a clear and concise manner in an easy to use application. Information gathering is an important tool to use but using interactive methods to communicate and simulate, engages the candidate on a higher level. It is one thing to write a paper and read it but another to have the ability to dynamically present as an interactive method. The JP Morgan community is connecting candidates with other candidates and also with the recruitment team through the use of discussion boards to keep all parties up to date on the latest happenings. Information on specific functions occurring on university campuses or discussing a question about the interview process can be found using this tool. The *discuss* feature not only engages the candidate but provides critical information as well.

The most interesting interactive feature incorporated into JP Morgan Community is *Trade Up*. Its purpose is to simulate the role of a Trader at JP Morgan giving candidates an opportunity to learn about trading and put their skills to the test. As a player, the goal is to build a portfolio that will maximize your return through the trading of ETFs, FX, and commodities. There are incentives for weekly winners as well as a grand prize given at the conclusion of the game. Players are vying for an interview for a summer internship with JP Morgan's recruitment team. As well weekly winners are provided with the unique opportunity of submitting their CV to a member of the JP Morgan recruitment team in order to receive constructive feedback.

Trade Up provides candidates with the exclusive chance to transform the knowledge that they have learned in the classroom into something tangible. This also provides JP Morgan with the opportunity to truly diversify their candidate pool by not only having those with superior academic backgrounds but also those who have the ability to translate their academics into a real world skill set.

Aside from the interactive role of *Trade Up*, JP Morgan and candidates can keep each other with up to date information on events as well as discussion through the *Discuss* section of JP Morgan Community. Besides a communal discussion board each university in which JP Morgan hosts an event is given their own page describing the event as well as who will be in attendance. This allows for the constant flow of information and communication between both parties. Keeping the process open and transparent.

Other features include a section to *Get Involved* highlighting opportunities such as

Winning Women Leadership developed to help women currently at JP Morgan to meet the next generation of female leaders. As well as **Teach for America** designed to eliminate educational inequity. Full-time analyst accepted into this program are automatically given a deferral start date to pursue this opportunity.

Summary

JP Morgan Community is the one stop shop for candidates to access information and connects with JP Morgan employees as well. It provides a simple but effective approach to getting candidates what they need. As a result of leveraging Facebook's popularity amongst the target demographic JP Morgan has 6642 fans and JP Morgan Community has 3515 monthly active users since going live only 6 months ago (Facebook.com).

JP Morgan is seeing tremendous ROI, in a recent *Fortune* survey MBA graduates ranked JP Morgan as the 10th most desirable place to work up 12 spots from 2007 and the highest ranking

they have seen since 1998 (fortune). It is clear that introducing such a crisp and interactive application has proven a success to the JP Morgan marketing and recruitment teams.

Until now there has not been an organization to tap into such a resource. JP Morgan has pioneered something in Facebook that has the potential to revolutionize talent recruitment. Through JP Morgan, Facebook, and Noise marketing, “*This is where you need to be*” (JP Morgan Community).

COLLABORATION – WHAT IT TAKES TO BE SUCCESSFUL?

There are a number of collaboration execution capabilities that need to be enabled to successfully take advantage of Web 2.0 solutions. Like any new capability for development, investments are required in multiple areas for successful execution and cultural integration. Outlined below are a number of key success areas that are key to accelerate collaboration and knowledge management socialization practices.

- **Governance and Leadership**– Organizations that have been successful in developing strong collaboration cultures and business processes have had strong senior executive sponsorship, and ongoing governance planning. Leadership behavior is one of the most critical success factors for developing a successful collaboration business model. If leadership behaviors do not exhibit behaviors like: appreciative inquiry, trust making, openness, authenticity, transparency, knowledge sharing, teamwork skills then overlaying collaborative toolkits without a strong governance and leadership foundation will only result in weak collaboration cultures.
- **Culture** - A cultural evolution requires leadership alignment in vision and practices. Attracting, developing and retaining talent that exhibits strong socialization

and collaboration practices that includes: knowledge sharing, teamwork, discussion, cooperation, openness, trust, and risk-taking will have healthier socialization execution capabilities. Generation X and Y’s in particular have a need for stronger socialization and collaboration work practices – and the next crop of graduates raised on instant messaging, Facebook, and virtual world rich media experiences from sites like: Webkinz, WhyVille, The Penguin Club, and Second Life simply won’t be attracted to organizations they believe are “simply not with it.” Organizations that strengthen their collaboration, trust sense making and socialization culture values will innovate and sustain competitive advantage more effectively.

- **People** – Organizations committed to developing an increased collaboration business strategy will need to develop ways of monitoring the organization’s cultural evolution. This can be done by introducing new employee performance metrics, tracking employing attitudes, focus group interviews etc. The most important signal that a culture is shifting to a stronger collaborative culture is by placing leaders in senior level roles and promoting talent based not on their ability to simply get results, rather on their ability to lead, motivate and grow talent successfully.
- **Process** – Organizations that embed collaborative business models and trust sense-making into business processes and practices increase knowledge worker productivity and improve organizational intelligence.
- **Organization** – Companies that invest in collaboration and knowledge worker innovation and productivity strategies and have an overall organizational design roadmap to integrate collaborative capabilities improve their ROI significantly.

Social Knowledge Case Study

- **Technology** – The last ten years have evolved significantly collaborative technology capabilities from simple email to rich multi-media collaboration conferencing capabilities delivered by alternative access devices (web, mobile, voice, etc).

In summary, organizations need to learn how to effectively use Web 2.0 or Enterprise 2.0, Social Mediated Technologies or they will not attract, develop and retain successfully the next generation of talent. Companies that embrace new ways of working will achieve greater competitive advantage and knowledge worker productivity gains. More importantly – these community socialization practices are like new fuel to accelerate innovation.

ACKNOWLEDGMENT

Primary Case Study research for the Molson Coors and JP Morgan Case study was completed by Cathy Koop, prior CIO of McGraw Hill, and Past President of the Canadian CIO Association of Canada. She is currently completing her executive MBA at the Richard Ivey School of Business University of Western Ontario. She is also a partner of Helix Commerce, and Alex Watson, Helix Associate, who has a B.A. Honors in Political Science from the University of Waterloo. Alex has expertise in Enterprise 2.0 and financial risk management practices.

REFERENCES

Collins, H., Gordon, C., & Terra, J. C. (2006). *Winning at Collaboration Commerce: The Next Competitive Advantage*. Boston: Elsevier.

Gordon, C. Weir, A, & Haynes, K. (2009). *Virtual Worlds – A Universe of Opportunity*. Helix Commerce International Inc. Retrieved from www.helixvirtualworlds.com

Gordon, & Iyar (2008). *Why Buy the Cow? How the on-demand Revolution powers the new knowledge economy*. Lulu.com.

Molson Coors Fact Sheet. (n.d.). Retrieved from http://molsoncoors.com/templates/molson_coors/pdf/MCB_Fact_sheet.pdf

Molson Corporate Responsibility Report. (n.d.). Retrieved from <http://molsoncoors.com/cr.report/>

Molson Interview with Digital Social Media Leaders: Ferg Devins, Chief of Government and Public Affairs, Ross Buchanan Director of Digital and Relationship Marketing, and Tanya Hammer, PR and Web 2.0 Coordinator (2009).

Rand, M. (2004). What is a wiki, how can they be used? Retrieved from <http://forbes.com/best/2004/1213/bow001.html>

Wikipedia (n.d.). *Wiki*. Retrieved from <http://en.wikipedia.org/wiki/Wiki>

ENDNOTES

- ¹ List of Molson corporate responsibility programs, policies, principles, partnerships, research, and performance metrics, is detailed in the Corporate Responsibility Report at <http://molsoncoors.com/cr.report/>
- ² Molson Coors Fact Sheet, http://molsoncoors.com/templates/molson_coors/pdf/MCB_Fact_sheet.pdf
- ³ The list of stakeholders also includes joint venture partners, unions, other governments that govern negotiated treaties, and investors. 2009 Annual Report.
- ⁴ Molsons Coors Interview with Ferg Devins, Chief Public Relations Officer.
- ⁵ Molson in the Community corporate group blog site: <http://blog.molson.com/community>.

Chapter 5

Social Knowledge in the Japanese Firm

Benjamin Hentschel
Sophia University, Japan

Parissa Haghirian
Sophia University, Japan

ABSTRACT

It is widely accepted that the Japanese conception of organizational knowledge differs from the Western view, with the former focusing on tacit knowledge and the latter more on explicit knowledge. The distinctive advantage of Japanese companies is widely believed, therefore, to be their unique ability to continuously create new knowledge by means of the dynamic interaction of individuals. Some aspects of Japanese culture are particularly influential on this knowledge management style, such as the strength of face-to-face communication and the emphasis on gestures, behavior and context. These are cultural factors that have shaped Japan's distinctive organizational communication structures in periods of high economic growth. However, having survived the "lost decade," Japan's companies now face a completely new business environment. As new technologies enable new modes of communication between a company's employees, the use of social media in order to facilitate knowledge-sharing (social knowledge) has become widespread. Based on a qualitative study conducted in a Japanese organization, this chapter investigates the extent to which social knowledge influences communicative behavior, and looks at the implications for organizational communication patterns in Japan. The findings of this study point towards changing patterns of social knowledge in Japanese firms.

KNOWLEDGE MANAGEMENT IN JAPAN

Most scholars agree that intangible assets are far more important for a firm's success than their

tangible counterparts. As well as the traditional production factors crucial for a firm's success (land, labor, and capital), knowledge is nowadays considered as equally important (Wickramasinghe and Von Lubitz, 2007). Numerous authors have stressed the critical role knowledge has for a firm's sustainable success (Nonaka and Takeuchi, 1995;

DOI: 10.4018/978-1-60960-203-1.ch005

Drucker, 1992). However, even if knowledge is highly valued as an intangible good, it is very hard to manage. An individual who possesses expertise in a certain field might take his knowledge with him by leaving the company. Likewise, an organization can acquire new knowledge and therefore increase the organization's potential by employing new workers or engaging in projects jointly with non-organizational parties (Hentschel and Haghirian, 2010).

As society entered the 21st century, organizations increasingly faced challenges stemming from the globalization of their operations, management, and knowledge assets. The ability to “develop intellectual capital through knowledge creation and knowledge-sharing on a global basis” is identified as one of the key determinants of a company's success (Ichijo and Nonaka, 2007, p. 3). Knowledge management therefore plays an important role in success: but as knowledge becomes increasingly important for multinational corporations, cultural differences in how knowledge is managed cannot be ignored. Recent studies have emphasized the vital importance of culture as a major variable that influences knowledge-sharing in an organization, as well as knowledge transfer across national boundaries (Siakas and Georgiadou, 2008, p. 50). Japanese knowledge management has been discussed especially widely in the last twenty years, as it presents a complementary style of managing knowledge to that of the West. Japanese knowledge management evinces some particular features that have long been an inspiration to Western managers and management researchers. But advances in technology, and recent changes in Japanese society and its economy, have affected the approaches to managing knowledge in Japan. At the same time, there are changes occurring in the nature and relevance of social knowledge. Social knowledge, as defined by Girard and Girard (2009), is “the use of social media to create, transfer, and preserve organizational knowledge—past, present, and future—with a view to achieving the organizational vision.”

The following chapter discusses the role and relevance of social knowledge in Japan. In this regard, the chapter first presents an overview of Japanese knowledge management and its particularities. After this, new challenges and changes in the Japanese economy which impinge on knowledge management issues are discussed. Finally, the chapter presents the results of an exploratory study of how Japanese knowledge management is affected by these changes, and discusses whether they have led to an increase in social knowledge in the Japanese firm (J-Firm).

Tacit Knowledge

Japanese managers put great emphasis on tacit knowledge (Takeuchi, 2001). A Japanese company requires employees to understand without being told exactly what to do. Business practices rely more on tacit understanding—e.g., written contracts are kept simple, or do not even exist, in cases where a Western firm would expect extensive articulation. Social situations must be “read” with great precision. Tacitness and the talent for working with tacit knowledge are important (Hedlund and Nonaka, 1993). This strongly influences the way knowledge is perceived in Japanese management. Japanese knowledge management does not only consist of data or information that can be stored in the computer; it also involves emotions, values, and hunches (Takeuchi, 2001).

Western epistemology, on the contrary, has traditionally viewed knowledge as explicit (Nonaka et al., 2001) and a Western corporation cannot rely on tacit knowledge to such an extent. Knowledge is believed to be unchanging and true regardless of social circumstances (von Krogh et al., 2000). Hence, Western firms are uncomfortable with purely tacit knowledge—as is the Western individual (Hedlund and Nonaka, 1993). Nonaka (1994) calls the Western explicit knowledge-oriented approach the “knowledge of rationality.” Western companies are effective in creating knowledge concerning facts. Knowledge of rationality

tends to ignore the importance of commitment, and instead centers on reinterpretations of existing explicit knowledge (Nonaka, 1994).

Employees in Western organizations hardly ever stay for decades in the same company. Allowing them to gain too much tacit knowledge may improve company procedures, but becomes problematic if employees owning a high degree of tacit knowledge decide to change their jobs or leave the company for any reason. The Western corporation therefore focuses on explicit knowledge, which makes work processes and results independent of individuals. It usually emphasizes the extraction of knowledge and develops and promotes mechanisms to store knowledge in the corporation's knowledge tools.

Personal Communication and the Free Flow of Knowledge

Another major difference between Western and Japanese approaches to knowledge management is the importance of informal knowledge and information. To keep harmony and a feeling of belongingness within the group, the exchange of informal knowledge is essential. Most Japanese companies therefore implement a number of operations to allow employees to meet and communicate in a relaxed manner. These activities include *nomikai* (dinners with co-workers after work), *gasshuku* (short excursions with co-workers), or frequent tea or coffee breaks. During these events, employees do not necessarily only exchange work-related knowledge and information; most of the conversations do naturally involve work, but during these events participants can also criticize their organizations or superiors. In any event, they do support knowledge-sharing within the corporation. In their book *The Knowledge-Creating Company*, Nonaka and Takeuchi (1995) relate a story in which managers during a *nomikai* came up with a new idea on how to develop a new product. The main idea here is that the course of informal knowledge-exchange leads to an increased

exchange of formal or informal knowledge that leads, in turn, to competitive advantage.

It is therefore not surprising that the main difference between Western and Japanese knowledge management is the way employees communicate within the corporation (Mestre et al., 1999). The strength of the communication in Japanese organizations is a mixture of both upward and downward communication along the hierarchical levels (Table 1).

Communicating within a Japanese group, team, or corporation has the overall goal of increasing group consciousness and harmony within the group. In doing so, the overall corporate vision can be instilled into all members of the organization. Harmony and free communication between all members increase the feeling of belonging to an organization and the sense of enthusiasm toward corporate goals. These communication processes do not only refer to formal information and knowledge: a Japanese organization also allows informal or personal information and knowledge communication between all members of the organization.

Western companies, on the contrary, do not always value the exchange of personal or non-work-related information and knowledge in the workplace. Informal information is strongly associated with gossip or rumors, and these are not welcome in a Western business environment. Employees are requested to focus on their work and on the communication and sharing of work-related information. Even if there are company events that allow employees in a Western organization to build better relationships with each other, the main focus here lies on team-building and not so much on knowledge transfer.

In recent years there have been a number of attempts to introduce alternative methods of knowledge communication, such as storytelling to improve interest in sharing knowledge. Despite this, exchanging informal information is not yet the focus. Even though a number of practitioners encourage the exchange of personal informa-

Table 1. Functions of visual communications in Japanese organizations

<i>Function</i>	<i>Question to ask</i>	<i>Definition</i>
<i>Signal group membership</i>	<i>Who are we?</i>	Highlighting the uniqueness of one's own company to others
Acquaint members with corporate vision and culture	Why are we here?	Developing a unified mental model of values, beliefs, and emotional attachments
<i>Maintain corporate vision</i>	Why should we keep being and doing as we are?	Continuous task of informing, reminding, and motivating people regarding their identity, purposes, and values.
Alert members to changes in the work environment	What requires our attention to be successful?	Informing corporate members of changes in job requirements, market fluctuations, staffing, and production goals
<i>Manage human relations</i>	How can we get along?	Assisting in managing complexities of people and groups in conflict-related situations
Provide avenues for expression	How do we feel?	Enabling employees to express their emotions and visions regardless of their status
Transform the corporate paradigm	How do we get from here to there?	Nurturing the thinking of business in radically different ways

Source: Mestre et al. (1999, p. 38 et seqq., slightly modified).

tion and stress its value, arguing that business relationships flourish when personal details are shared and that work-related information is only a small part of the communication processes in a company (Collison and Parcell, 2004), the value of person- and people-related knowledge is not yet recognized in the Western firm.

Comparing Knowledge Management in Japan and the West

People's beliefs and values are embedded in their national culture, which is strongly related to their knowledge management (Wang and Schulte, 2005). In this sense, there are fundamental differences that become evident between the Eastern and Western perceptions of how to deal with knowledge. An overview of these differences is presented in the following table.

Japanese organizations are more group-based, rely on experience, and are tacit knowledge-oriented, whereas Western organizations put strong emphasis on analysis, individual-autonomy, and explicit knowledge (Nonaka and Takeuchi, 1995).

The Western approach to knowledge sees it as a thing that can be made explicit and thus as being "capital that can be valued"; while the Eastern philosophy sees knowledge as an "unfolding truth," and proposes a "[u]nity of universe and human self" that makes the creation of knowledge a "continuous, self-transcending process" (Andriessen and Van den Boom, 2007, p. 648).

Knowledge in Japan is seen as an ongoing process, whereas in Western corporations knowledge is an asset that can be managed, moved, bought, and sold. Japanese knowledge management is based on group processes and thinking, whereas in the West individuals play the major role in knowledge-creation. This leads to focused information-seeking, whereas creative chaos and open discussion dominate knowledge-creation in the East. Nonaka and Takeuchi (1995) characterize knowledge management in Western countries as "a machine for information processing," in contrast to the Japanese company's view of the organization, which can be described as a "living organism" (Nonaka, 1991, p. 97).

Table 2. Differences between eastern and western views on knowledge and its management

<i>Japanese</i>	<i>Western</i>
Group-based	Individual-based
Tacit knowledge-oriented	Explicit knowledge-oriented
View of knowledge as part of a process	View of knowledge as an asset, which can be moved, bought, and sold
Knowledge is no leverage of individual's power	Knowledge is a leverage of individual's power
Emphasis on experience	Emphasis on analysis
Knowledge management highly integrated in company's operational activities	Knowledge management less integrated in company's operational activities
Group autonomy	Individual autonomy
Unity of knowledge and action	Knowledge as capital that can be valued
Redundancy of information	Information is focused on a certain topic
Creative chaos through overlapping tasks	Creative chaos through individual differences
Knowledge-creation as a continuous, self-transcending process	Thoughts and feelings can be made explicit and thus communicated and shared

Sources: Synthesis from Andriessen and Van den Boom (2007, p. 648), Haghirian (2006, p. 31), and Nonaka and Takeuchi (1995, p. 199).

Strengths and Weaknesses

Both approaches have strengths and weaknesses. Western organizations focus on strategic aspects of knowledge management and use knowledge in the most effective way by making it independent of its holders. Thus, a Western organization can keep knowledge resources for a longer time, and can continue to use them even if employees leave or decide not to share. This is not always easy, and many Western organizations struggle to develop adequate knowledge-management operations and to reach knowledge-management goals.

On the other hand, the competitive edge for which Japanese companies are famous adds up to more than just facts about managerial process. Due to distinctive cultural attitudes, the traditional Japanese organization favors the tacit knowledge embedded in each of its members and the belief in the organization as a group: values that have fostered the prospering of the organization by generating organizational knowledge out of every individual at a very fast pace. Nowadays, Japanese organizations that aim to effectively manage the knowledge-creating process are facing external

influences that might affect their knowledge-management practices. These developments, which were not visible a few decades ago, are scrutinized in the following sections.

Japanese companies can make use of all their employees' tacit knowledge and can further increase the number of ideas which are implemented in organizational processes. Organizations spend little effort in motivating their employees to share knowledge, since knowledge-management processes are already strongly implemented into organizational processes in Japan. The Japanese approach further promotes bottom-up knowledge communication. All members can easily participate in knowledge-management activities, regardless of their hierarchical position.

SOCIAL AND TECHNOLOGICAL CHANGES IN JAPAN

The economic recession, changes in Japanese society, and technological advancements have challenged traditional Japanese knowledge-management practices over recent years. Their

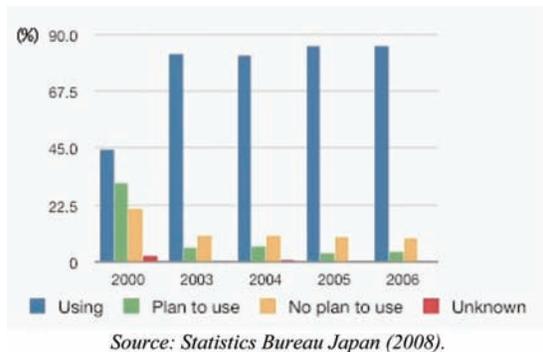
main features, such as the importance of tacit knowledge and the high level of personal communication when transferring information and knowledge, have suffered from these developments. The following developments have had a major influence on how knowledge is managed within the J-Firm.

Technological Advances

In recent years, computer-mediated communication has been identified as a key driver for organizational knowledge-sharing (Dalkir, 2008). A White Paper published by the Ministry of Public Management, Home Affairs, Posts, and Telecommunications (MPHPT, 2004) investigates the impact of new technologies, and especially the new potentials realized by the use of networks.¹ The connections between broadband users and close relatives and friends have increased, but at the same time the majority of the respondents recognized that their working time had increased as well.

An increase can be also observed in terms of Internet usage. Figure 1 illustrates the usage of the Internet by Japanese businesses in recent years. Whereas in 2000 less than half of the businesses in Japan made use of the Internet, the percentage almost doubled in 2006, reaching 85.6 percent.

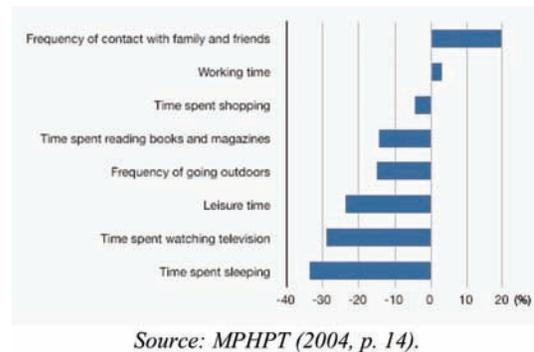
Figure 1. Use of the Internet by Japanese business establishments (2000–2006)



More than a quarter of the participants answered that their leisure time had decreased due to network usage. The use of communication tools that comes with new technological breakthroughs does not only shape the way in which people interact with their environment but also the possible ways in which an organization can communicate with its customers (Ozuem et al., 2008). What is more, it changes the way in which people communicate within organizations. However, it should be mentioned that this development can also manifest itself in negative ways. The increasing usage and integration of information and communication technology (ICT) is likely to correspond with an increase in social problems such as flaming,² false and fake group consensus, rumors, and group inefficiency (Nishida, 2002). Johnston (2008) further underlines that the emergence of the so-called Web 2.0 applications³ gives rise to the “Information Workplace,” describing the ability to “support the generation, documentation, and sharing of knowledge” in completely new ways.

Indeed, as the Ministry of Internal Affairs and Communications⁴ (MIC) illustrates, there is a small but visible increase in the percentage of businesses that operate Social Networking Services (SNS) and blogs, from 4.4 percent in 2006 to 6.8 percent in 2007 (MIC, 2007). This upward trend of 2.6 percent represents the tendency of

Figure 2. Changes in the lifestyle of broadband owners as a result of using the network



businesses to exploit the possibilities of Web 2.0 applications. Inoue (2007) also states that Web 2.0 has given rise to a variety of so-called knowledge communities that are formed on the basis of an N-to-N⁵ model, such as Wikipedia, or question and answer (Q&A) portals, creating “a vast amount of knowledge that cannot be ignored in terms of both quality and quantity [and] is edited and accumulated every day” (ibid., p. 3). He argues that a company can greatly benefit from this external knowledge if they know how to utilize it. This is consistent with Nonaka and Toyama’s statement (2005, p. 430) that the organization’s *ba* has to be extended beyond the organization’s boundaries, enabling the integration of knowledge from “various outside players.” However, in the case of knowledge communities, Inoue (2007) postulates that few Japanese companies have so far shown an inclination to utilize them.

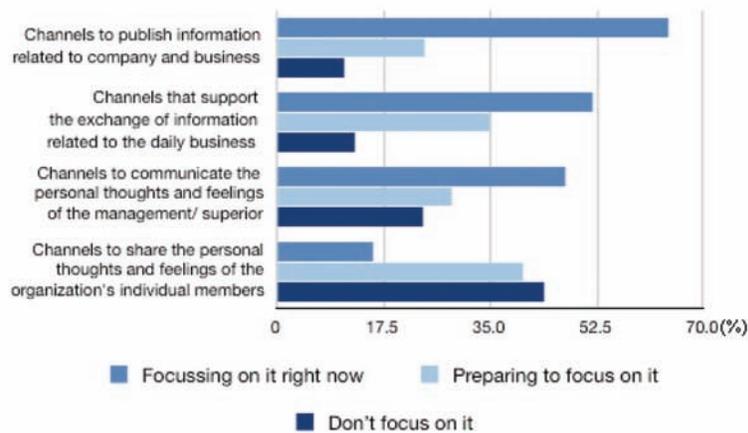
The MPHPT (2004) further highlights the forthcoming challenge of utilizing so-called “ubiquitous networks” in Japan. These networks⁶ can be defined as infrastructures that are accessible from almost anywhere via a wide range of different terminals such as laptops, cellular phones, personal digital assistants (PDA), or televisions (Kitamura, 2002). The MIC (2005) predicts the de-

velopment of Japan into what they call “u-Japan,”⁷ with ubiquity of such networks – i.e. “to connect everyone and everything” – as its key aspect. For organizations, the evolution of ICT also bears new possibilities regarding the collaborative activities of groups independent of where their members are located (Serrano and Fischer, 2007).

In a recently conducted Internet survey⁸ among the subscribers of the Japanese mail magazine *Jinzai Kyouiku* (Human Resource Development), the structure of communication in Japanese organizations was scrutinized. Tokuoka (2007) stated that “communication tools are the alpha and the omega⁹ of a solid relationship in the workplace between superior and subordinate.” One of the questions that the survey concentrated on was related to the usage of communication tools in Japanese organizations (Figure 3).

Possible communication tools were grouped into four categories (i.e., channels). These were: channels which publish information related to company and business (e.g., internal information, internal message boards, and internal notification mails); channels that support the exchange of information on a daily basis (e.g., electronic mail, internal portal sites, and knowledge management tools); channels for personalized top-down com-

Figure 3. Communication styles in Japanese organizations



Source: Tokuoka (2007, p. 26).

munication (e.g., the homepage of the section chief, president's message mails); and channels for personalized bottom-up communication (e.g., blogs, SNS, company's staff trips, and more informal internal meetings). Most notably, almost two out of three companies surveyed concentrated on communication tools that facilitate the publication of business-related information inside the organization. More than 50 percent of the respondents used tools to exchange information about daily business, and a little under 50 percent actively supported top-down information structures. Surprisingly, only about every sixth company surveyed made use of communication tools that promote the thoughts and feelings of the organization's individual members. However, about 40 percent planned to make greater use of the internal bottom-up communication structures that are enabled by tools like blogs or SNS. The other, smaller, fraction of the surveyed organizations had no current plans to do so. What is more, the same survey also reveals that the most-used electronic communication tools were e-mail and the company's Intranet (Tokuoka, 2007).

Baby Boomer Retirement

Another challenge that Japanese corporations face is the long-term effect of the focus on tacit knowledge. Since 2007, Japan's baby boomers (Japanese born between 1947 and 1949) have started to retire. Their number is very high: current calculations assume that more than 6.8 million Japanese, or about 10 percent of the Japanese workforce, fall into this category (Kohlbacher and Haghirian, 2007). They are the classic salarymen and the backbone of Japanese post-war economic development. Many of them are living examples of the lifetime employment system, and have worked in the same corporation for more than thirty years. Thus, they have become the knowledge stock of their organizations, and the fact that they are leaving creates major problems for the companies, as they take their tacit knowledge

with them. In many cases no knowledge has been stored, because the employees had been available to the company for the last forty years.

With the beginning of the new millennium, many Japanese companies realized the need for transition and are trying to reorganize themselves. Concentrating on tacit knowledge obviously has a high price, and many Japanese organizations have started to develop mechanisms to extract knowledge from their long-serving employees. Western companies have more experience in extracting knowledge from employees, and can offer interesting role models for Japanese organizations. Japanese companies like Mazda are now trying to store their knowledge and have started to develop a number of mechanisms to share and transfer implicit baby boomer knowledge. Baby boomers are being rehired or retrained as trainers and coaches for younger employees (Onishi, 2009).

METHODOLOGY AND RESEARCH QUESTIONS

All these changes impinge on the traditional way general knowledge is managed in Japan, and consequently also on the usage and relevance of social knowledge management within Japanese firms. In this chapter we present results of an exploratory study that investigates the importance of social knowledge in the contemporary J-Firm, seen especially in the light of the aforementioned recent developments affecting Japan.

The investigation is based on a series of qualitative interviews in a Japanese electronics company, which we will call Company X. In total, five employees were interviewed, with each of the five interviews lasting between sixty and ninety minutes (Table 3). The interviews had an open-ended structure and were conducted in the participants' mother tongue, namely, Japanese. The authors favored this approach in order to encourage the interviewees to answer as freely as possible. The overall research design followed

Table 3. Overview interviewees

Interview	Gender	Position
1	Male	Senior Manager
2	Female	Staff
3	Female	Manager (Marketing)
4	Male	Manager
5	Male	Staff (Research)

Source: Authors.

the “grounded research” approach first introduced by Glaser and Strauss (1967). All interviews were taped, on the interviewee’s permission. The taped material was then transcribed by the researcher and rechecked for possible mistakes with the help of Japanese native speakers. The transcripts were then coded in three steps following the premises of the grounded theory approach (Dey, 1999, p. 98).

The questions asked centered on the communicational behavior of employees at Company X: Among them were “How do people communicate in your company?”, “What technologies are used to support inter-organizational communication?”, and “Do you perceive any changes in your company in how people communicate?” Consequently, the research questions that guided the authors’ study were the following:

1. How is social knowledge communicated in the contemporary J-Firm?
2. Does the manner in which employees communicate change due to the use of social media?
3. What are the implications of the changing patterns of social knowledge for the J-Firm?

Results: New Communication Styles in the Japanese Firm

As shown above, the main elements of Japanese knowledge management are the high amount of tacit knowledge within the firm, the free and open communication of knowledge and information,

and the importance of group-based knowledge-creation processes. With this in mind, the results of the investigation are now presented. The main focus of the interviews was placed on the interviewees’ observations regarding how knowledge and information were managed within the firm and what changes they had identified over recent years. Our special interest lay in the question of whether the management of knowledge in the J-Firm has changed and what role social knowledge plays.

Communication

When it comes to internal or external communication, it is not a big surprise that correspondence via e-mail has the most significant impact on organizational communication behavior. Similar to communication via a company’s Intranet, e-mail exchange belongs to virtual communication, and thus transmits the bare information without the context that both sender and receiver usually need to share. Much more than using message boards or organizational question and answer sites, workers in Japanese organizations engage in communication via e-mail almost constantly.

Several statements made by the interviewees underline this development. Four of the five people interviewed stated that people at Company X communicate a lot via e-mail (interviewees 1, 2, 4, and 5), and one mentioned e-mail as important in connection with the company’s Intranet (interviewee 3). Three interviewees felt that there had been a dramatic increase in the use of e-mails over recent years (interviewees 2, 4, 5). What is more, interviewees articulated the impression that there is almost *only* communication via e-mail: “*I have the feeling that everyone communicates via e-mail, even the people sitting right next to each other. Especially the developer and software developer barely talk to people, even when having contact with their neighbors, they use e-mail*” (interviewee 4).

Whereas interviewee 2 said: “*After all, at Company X, through the influence of the Internet*

the writing of e-mails and various communication tools [...] communication under the influence of the Internet increased tremendously.”

Similarly, interviewee 5 said: *“I think that e-mail came with an enormous speed to the Japanese company. [...] How many years has it been? Didn't it all start in the 1980s? [...] At Company X, every worker had a workstation as well and when I entered the company in the 1990s, everybody used e-mail already. I think this is probably the number one mail culture [...]. I think, depending on the department, only e-mail is used to communicate. E-mails are also exchanged with the person sitting next to one.”*

Furthermore, the Internet, which was mainly used with stationary desktop computers, is now broadly accessible by highly portable devices, like notebook computers and PDAs. Thus people are able to engage in virtual communication almost anywhere and at any time. As a result, the utilization rate of mobile communication tools is increasing and organizational members are more likely to communicate virtually.

Interviewees predicted that the use of ordinary desktop computers will decrease, while the steadily increasing number of mobile computers will enable people to communicate over great distances. Although the usual desktop computer still prevails as the main instrument of virtual communication, electronic communication tools that are handier, smaller in size, and better integrated in a person's environment are on the increase. A statement made by interviewee 5 exemplifies this view: *“Lately, mobile mails in Japan increased a lot. [...] the exchange via mails that were written with a mobile phone is now increasing at a terrific pace.”*

Another interviewee highlighted the development of ubiquitous computing tools, with which individuals can access the digital world from almost everywhere: *“Well, the power of computers will become embedded in the environment, as though everything will happen in the background. [...] In our world, it is shifting toward a method without using the computer. For instance, the*

iPhone, it doesn't look like a computer, does it? But inside, we find an enormously powerful computer” (interviewee 4).

Intranet

Apart from online tools – the usage of which is increasing in Western organizations as well – one knowledge-sharing tool that had increased in relevance at Company X is the Intranet. An organization's Intranet is a platform for the exchange of information on a company-wide scale, regardless of where the organizational members are located. Via Intranet, intra-organizational communication can be achieved very quickly and between multiple peers, and this is a vital tool in keeping organizational members informed about developments in the company. However, when communicating via a virtual platform like the company's Intranet, the receiver and sender of the information can hardly share the same context, for they are not interacting with each other in the real world but on message boards or forums.

The Intranet at Company X provides several functions for the sharing of information. It can be accessed by opening a comprehensive portal site. From there, every organizational member can access various news pieces, press releases, and also information about the market, the customers, and the competitors (interviewee 3). Organizational members check frequently on the information distributed over the Intranet. One interviewee stated that he uses it practically every day (interviewee 5). One of the Intranet tools to exchange information is the Voice of Customer (VoC) system. Interviewee 3 averred that to know what satisfies the customer's needs is very important. The VoC system, through which the customer's needs and opinions are collected and distributed on an organization-wide scale, provides organizational members with information of great value. By listing the mere information about the customers' preferences, it is not always easy to know what really counts as valuable for the customers. The

personal aspect of the message – i.e. the shared background – is lost, a circumstance that is not favorable for an organizational culture wherein context plays a significant role in sharing ideas and knowledge. Consequently, although considering internal databases to be an important tool, interviewees still perceived problems regarding their use. The de-personalization of the message entered is one of the most significant disadvantages. A statement made by interviewee 4 illustrates this: *“There is a lot of Voice of Customer’s information in the databases, but because they are all explicit documents, independent of the situation and the character of the person, well, they are in a state where the personalization and the situation are lost.”*

Another interviewee is further convinced that this de-personalization is highly problematic and that it leads to questions regarding how exactly those databases can be efficiently built: *“If we look at it from the point of view of everybody’s activity, we understand that there is a relationship between this information and this information and this information.... However, if we think about it from the sole perspective of the document, the data, each [piece] is separated from the others.... Well, I think that this might be a problem, to look at it mainly from an IT perspective”* (interviewee 4).

Implications: Social Knowledge in the Japanese Firm

Virtual communication includes interaction between organizational members that is facilitated through the aid of technologies like Intranet platforms, e-mail, or mobile devices that enhance organizational communication. These play a vital role in sharing and combining codified knowledge inside an organization. Several pieces of evidence regarding communicative behavior in virtual environments could be obtained from the narratives of the interviewees and are presented below.

Personal interaction and knowledge-sharing is dramatically decreasing in the J-Firm. At the same time, communication via computers and other technologies is increasing. However, when two people exchange information via e-mail, on message boards, or with the use of Q&A sites, the message itself is already coded – i.e., made explicit. By this means, virtual communication is less likely to be favored by a culture that relies heavily on context in order to give meaning to a transmission. Our findings are summarized in Table 4, where virtual communication and personal communication are presented in a two-dimensional model.

Table 4. Shifting from personal to virtual communication in Japanese firms

	Communication type	
	Personal communication	Virtual communication
Status	Decreasing	Increasing
Evidence	Fewer informal meetings in the workplace	Intranet is used very frequently
	Strengthening of organizational boundaries	Virtual communities to discuss problems and to share thoughts
	Less contact between organizational members belonging to different departments	E-mails are written often, even between individuals sitting next to each other
	Decline in participation at informal after-work meetings	Increase of portable devices to exchange information
Problems for knowledge management	Face-to-face exchange of ideas between people with different backgrounds is reduced	The stored (explicit) information lacks the required context in order to understand it entirely

Source: Authors.

The shift from personal communication to technology-based communication is obvious. The number of informal meetings is decreasing. Accordingly, organizational boundaries are perceived as stronger and more difficult to overcome. Technology becomes increasingly important in managing and sharing knowledge, a development which has also been shown in other recent research results. Nomura (2002) showed that “typical R&D people and corporate staff are [...] lacking contact with customers and communication with other companies.” He further concludes that there is a lack of interaction between members of cross-functional teams. Critical for the process of socialization is the need to communicate directly with other individuals to effectively share each other’s thoughts and embedded knowledge.

With respect to personal communication within the firm and even with customers, the question arises of how traditional Japanese knowledge management will be affected by these changes. Some authors put forward the assumption that traditional Japanese management practices are in a state of change, and it appears to be only a matter of time until some of them become obsolete (Mroczkowski and Hanaoka, 1998; Porter et al., 2000). What is more, Motohashi (2003), for example, stresses the fact that “the Japanese model [of knowledge management] is no longer suited to today’s environment.” However, as the study of knowledge in organizational contexts is still a markedly underexplored field, little is known about the changes in the area of traditional Japanese knowledge management.

Nonaka and Takeuchi (1995) highlight the fact that the Japanese knowledge-creating company is built upon the significance of tacit knowledge, and the high level of institutionalization of personal relationships. The perceptions of the status quo, as reported by the interviewees from Company X, indicate that there is a shift from personalized face-to-face communication to less personal communication. In the case of the latter, people are less likely to share the common context about a

topic that is necessary to successfully exchange information. These developments are partly being brought about by technological advancements and partly by the need to work fast and efficiently because of the increasing international competition the Japanese industry faces.

DISCUSSION AND OUTLOOK

With these circumstances in mind, the question emerges of how a traditional Japanese organization copes with increasing virtual communication among its members. Is social knowledge becoming more relevant in the J-Firm? Can it provide solutions to the challenges Japanese knowledge management faces?

From the data gathered, the direction of the future development of Japanese knowledge management is not obvious. The interviews reveal that the employees at Company X are indeed aware of the consequences of the current developments. Consequently, they express the need for change regarding the manners of communication. As interviewee 3, said: “*The communication [at Company X] as of today is not sufficient.*” And interviewee 4 adds: “*Of course, there are those things like e-mail, chatting over the Internet and wikis, but the real important thing is this real [communication], because it only exists in the real world, I think that this part becomes important.*”

The effect that new communications styles may have on knowledge management and especially on the creation of new knowledge is also a topic of discussion. Nonaka and Takeuchi (1995) identify free communication within the Japanese social group as the main success factor regarding knowledge creation and new product development in the J-Firm. These competitive advantages may be threatened by the rise of new communication styles. Interviewee 1 sums this up: “*I believe that knowledge creation is not to think about something that is in the head, but rather when different people meet and have a conversation, when there are*

experiences born by meetings with the frontline and going to the field [out of the office].” This statement shows that the transformation of communication and knowledge management styles impinges on traditional ways of dealing with new ideas and innovation as well.

At this stage it is difficult to say whether social knowledge will play an increasingly dominant role in the J-Firm. So far, we can show that Japanese knowledge management is strongly affected by social, economic, and technological developments. Communication and knowledge transfer within Japanese corporations is increasingly performed via new technologies, yet personal interaction and knowledge creation within the group is declining. This development is seen as a major change in how knowledge and information is managed in Japan, and some authors even think that it might also impact on the creativity and competitive advantage of Japanese firms.

Thus, whether social knowledge will gain significant relevance for the J-Firm is not clear yet. On the one hand, the increasing importance of social media for companies cannot be denied. However, Japanese companies find it difficult to integrate the usage of social media into the foundations of traditional Japanese knowledge-management practices, which always put the human being and the uniqueness of face-to-face interaction at the center. The future will show how Japanese knowledge management will deal with this challenge.

The findings of this study suggest several directions for future research. First, more research needs to be done in order to identify the channels for social knowledge in the Japanese organization, especially in the wake of the increasing number of businesses that incorporate Web 2.0-based channels for knowledge sharing. Further, due to the significant cultural differences in knowledge-management practices between Japanese and Western organizations, the long-term impact of social knowledge in both corporate settings needs to be understood. Therefore, the authors stress

the importance of studies that not only look at the status quo, but investigate the underlying changes brought about by the increasing use of social media in organizations.

REFERENCES

- Allen, M. (2008). Web 2.0: An argument against convergence. *First Monday*, 13(3). Retrieved October 28, 2008 from <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2139/1946>
- Andriessen, D., & Van den Boom, M. (2007). East is East, and West is West, and (n)ever its intellectual capital shall meet. *Journal of Intellectual Capital*, 8(4), 641–652. doi:10.1108/14691930710830800
- Ang, Z., & Massingham, P. (2007). National culture and the standardization versus adaptation of knowledge management. *Journal of Knowledge Management*, 11(2), 5–21. doi:10.1108/13673270710738889
- Collison, Ch., & Parcell, G. (2004). *Learning to fly: Practical knowledge management from leading and learning organizations*. London: Capstone.
- Dalkir, K. (2008). Computer-mediated knowledge sharing. In Bolisani, E. (Ed.), *Building the knowledge society on the Internet: Sharing and exchanging knowledge in networked environments* (pp. 89–109). Hershey, PA: Information Science Reference.
- Dey, I. (1999). *Grounding Grounded Theory*. London: Academic Press.
- Drucker, P. F. (1992). The new society of organizations. *Harvard Business Review*, 70(5), 95–104.
- Girard, J. P., & Girard, J. L. (2009). *Call for papers – Social knowledge: Using social media to know what you know*. Retrieved September 24, 2009 from <http://www.igi-global.com/requests/details.asp?ID=613>

Social Knowledge in the Japanese Firm

- Glaser, B., & Strauss, A. L. (1967). *The discovery of Grounded Theory: Strategies for qualitative research*. Chicago: Aldine Publishing Company.
- Gray, P. (2007). Knowledge and hype. *Information Systems Management*, 24, 271–276. doi:10.1080/10580530701404470
- Haghirian, P. (2006). Japan - Vorreiter im Wissensmanagement? (In German: Japan – Still leader in knowledge management?). *Wissensmanagement*, November 2006, 30-32.
- Hedlund, G., & Nonaka, I. (1993). Models of knowledge management in the West and Japan. In Lorange, P. (Ed.), *Implementing strategic processes: Change, learning and co-operation* (pp. 117–145). Oxford, UK: Basil Blackwell.
- Hentschel, B., & Haghirian, P. (2010). Nonaka revisited: Can Japanese companies sustain their knowledge management processes in the 21st century? In Haghirian, P. (Ed.), *Innovation and change in Japanese management* (pp. 199–220). London: Palgrave MacMillan.
- Ichijo, K., & Nonaka, I. (2007). Introduction: Knowledge as competitive advantage in the age of increasing globalization. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 3–10). Oxford, New York: Oxford University Press.
- Inoue, T. (2007). Company management in the era of Web 2.0 - knowledge communities facilitate open innovation -. *Nomura Research Institute Papers*, 115.
- Johnston, R. (2008). Knowledge management in the Web 2.0 age. *Associations Now*, 57-61.
- Kitamura, M. (2002). Using ubiquitous networks to create new services based on the commercial and public infrastructure. *Nomura Research Institute Papers*, 54.
- Kohlbacher, F., & Haghirian, P. (2007): Japan und das Wissen der Babyboomer (In German: Japan and the Babyboomers' Knowledge). *Wissensmanagement*, January 2007, p. 22-24.
- Mackin, J. A. (1997). *Community over chaos: An ecological perspective on communication ethics*. Tuscaloosa, Alabama: University of Alabama Press.
- Mestre, M., Stainer, A., Stainer, L., & Strom, B. (1999). Visual communications - the Japanese experience. *Corporate communications. International Journal (Toronto, Ont.)*, 5(1), 34–41.
- MIC. (2005). *Information and communications in Japan - White paper 2005*. Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan. Retrieved October 20, 2008 from <http://www.johotsusintokei.soumu.go.jp/whitepaper/eng/WP2005/2005-index.html>
- MIC. (2007). *Communications usage trend survey - Press release*. Ministry of Internal Affairs and Communications, Japan. Retrieved October 29, 2008 from http://www.johotsusintokei.soumu.go.jp/tsusin_riyou/data/eng_tsusin_riyou02_2007.pdf
- Motohashi, K. (2003). The Japanese model: Shifts in comparative advantage due to the IT revolution and modularization. *Journal of Japanese Trade and Industry*, 30-35.
- MPHPT. (2004). *Information and communications in Japan - White paper 2004*. Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan. Retrieved October 29, 2008 from <http://www.soumu.go.jp/english/wp/wp2004.html>
- Mroczkowski, T., and Hanaoka, M. (1998). The end of Japanese management: How soon? *Human resource planning*, 21(3), 20-30.

- Nishida, T. (2002). A traveling conversation model for dynamic knowledge interaction. *Journal of Knowledge Management*, 6(2), 124–134. doi:10.1108/13673270210424657
- Nomura, T. (2002). Design of “ba” for successful knowledge management—how enterprises should design the places of interaction to gain competitive advantage. *Journal of Network and Computer Applications*, 25(4), 263–278. doi:10.1006/jnca.2002.0139
- Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, 69(6), 96–104.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37. doi:10.1287/orsc.5.1.14
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford: Oxford University Press.
- Nonaka, I., & Toyama, R. (2005). The theory of the knowledge-creating firm: subjectivity, objectivity and synthesis. *Industrial and Corporate Change*, 14(3), 419–436. doi:10.1093/icc/dth058
- Nonaka, I., Toyama, R., & Konno, N. (2001). SECI, ba and leadership: A unified model of dynamic knowledge creation. In Nonaka, I. (Ed.), *Managing industrial knowledge: creation, transfer and utilization* (pp. 13–43). London: SAGE Publications.
- Nonaka, I., Von Krogh, G., & Voelpel, S. (2006). Organizational knowledge creation theory: Evolutionary paths and future advances. *Organization Studies*, 27(8), 1179–1208. doi:10.1177/01708406060606312
- Onishi, A. (2009). Knowledge management. In Haghirian, P. (Ed.) *J-management; fresh perspectives on the Japanese firm in the 21st century* (pp. 204–225). Bloomington: iUniverse Star.
- Ozuem, W., Howell, K. E., & Lancaster, G. (2008). Communicating in the new interactive marketplace. *European Journal of Marketing*, 42(9/10), 1059–1083. doi:10.1108/03090560810891145
- Porter, M. E., Takeuchi, H., & Sakakibara, M. (2000). *Can Japan compete?* Cambridge, Massachusetts: Perseus Publishing.
- Saenz, J., Aramburu, N., & Rivera, O. (2007). Innovation focus and middle-up-down management model: Empirical evidence. *Management Research News*, 30(11), 785–802. doi:10.1108/01409170710832232
- Serrano, V., & Fischer, T. (2007). Collaborative innovation in ubiquitous systems. *Journal of Intelligent Manufacturing*, 18, 599–615. doi:10.1007/s10845-007-0064-2
- Siakas, K., & Gergiadou, E. (2008). Knowledge sharing in virtual and networked organizations in different organizational and national cultures. In Bolisani, E. (Ed.), *Building the knowledge society on the Internet: Sharing and exchanging knowledge in networked environments* (pp. 45–64). Hershey, PA: Information Science Reference.
- Statistics Bureau Japan. (2008). *Japan statistical yearbook*. Retrieved October 29, 2008 from <http://www.stat.go.jp/data/nenkan/zuhyou/y1113000.xls>
- Takeuchi, H. (2001). Towards a universal management concept of knowledge. In Nonaka, I. (Ed.), *Managing industrial knowledge: Creation, transfer and utilization* (pp. 315–329). London: SAGE Publications.
- Takeuchi, H., & Nonaka, I. (2000). Reflection on knowledge management from Japan. In Morey, D., Maybury, M., & Thuraisingham, B. (Eds.), *Knowledge management: Classic and contemporary works* (pp. 183–186). Cambridge, Massachusetts: The MIT Press.

Tapscott, D., & Williams, A. D. (2006). *Wikinomics: How mass collaboration changes everything*. London: Portfolio Hardcover.

Tokuoka, K. (2007). Kojin kiten no komyunikeeshon ga inobeeshon o hagukumu o jōsei (Communication that originates in the individual fosters the creation of a soil for innovation). *Jinzai kyouiku (Human Resources Development)*, 19(12), 24-35.

Von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation*. Oxford: University Press.

Wang, P. J., & Schulte, W. D. (2005). The state of knowledge management practice in Taiwan. In Stankosky, M. (Ed.), *Creating the discipline of knowledge management: The latest in university research*. Oxford: Elsevier Butterworth-Heinemann. doi:10.1016/B978-0-7506-7878-0.50010-7

Wickramasinghe, N., & Von Lubitz, D. (2007). *Knowledge-based enterprise: Theories and fundamentals*. Hershey, PA: Idea Group Publishing.

KEY TERMS AND DEFINITIONS

Tacit Knowledge: “Tacit knowledge” refers to knowledge that cannot easily be articulated or written down. It is strongly connected to its holder and cannot be easily transferred. An example of tacit knowledge is knowledge about how to perform intercultural negotiations.

Explicit Knowledge: “Explicit knowledge” refers to knowledge that can be easily articulated or written down. It is not strongly connected to its holder and can be easily transferred. Examples of explicit knowledge include company reports, blueprints, best practices, technical drawings, videos, and audiotapes.

Formal Knowledge: “Formal knowledge” refers to knowledge that is officially related to work and which is supposed to increase com-

petitive advantage when shared and re-used in an organizational context. Examples include knowledge about work processes, work content, and corporate goals.

Informal Knowledge: “Informal knowledge” is not considered related to work and is not directly seen as increasing the competitive advantage of the corporation. Examples include knowledge about personal attitudes of employees, managers or company owners, or unofficial reports on the status of the corporation.

ENDNOTES

1. Participants in the survey were allowed to give multiple answers. The percentage value was computed by subtracting the percentage of the people who answered with “increased” by the percentage of the people who answered with “decreased.”
2. The term “flaming” describes a way of attacking an individual’s or a group’s opinion, usually on digital message boards. These circumstances are often counter-productive for real argumentation (Mackin 1997, p. 228).
3. The term “Web 2.0” is in fact not easily definable. Allen (2008) refers to Web 2.0 under four different headings: (1) websites whose services allow the manipulation of certain data by the actions of humans and other computers; (2) as a business model in which the company sets up a website to collect user profiles and tries to generate revenue by allowing advertisers to aim at specific user groups; (3) as the description of the trend toward more and more users of the Internet “creating, maintaining, and expanding” its content; and (4) seeing it in a political sense, describing it as what he calls “libertarian capitalism.”
4. The Ministry of Internal Affairs and Communications was known as the Ministry of

- Public Management, Home Affairs, Posts, and Telecommunications prior to 2004.
5. N-to-N means “many-to-many”, in contrast to Web 1.0 which is described as instantiating a 1-to-N, or “one-to-many,” model.
 6. Kitamura (2002, p. 2) describes ubiquitous networks on the basis of three characteristics: (1) offering possibilities of high-speed data transfer and being accessible via “any mode or any medium”; (2) having the ability to be accessed from any kind of IT equipment; and (3) serving as an almost borderless virtual environment where data can be exchanged.
 7. With the letter ‘u’ representing the terms *ubiquitous*, *universal*, *user-oriented*, and *unique*.
 8. The survey was conducted between October 10th, 2007 and October 18th, 2007. The fact that the readers of *Jinzai Kyoiku* had to answer the survey on the Internet was probably the reason for the low response rate: among the roughly 3,700 subscribers only 171 filled out the survey. Thus, the response rate amounts to 4.6 percent – in other words, only one in twenty subscribers contributed to the survey.
 9. The original quotation makes use of the Buddhist expression “breath of a-un,” where the ‘a’ in ‘a-un’ refers to the first and the ‘un’ to the last sound that occurs when opening the mouth – i.e., in a broader sense, the beginning and the end of the universe. The authors have translated the quotation in favor of a Western readership.

Section 2
**Cultural Aspects of Social
Knowledge**

Chapter 6

Cultural Barriers to Organizational Social Media Adoption

Andrew Miller
Andrew-Miller.com, USA

ABSTRACT

From telephones to fax machines to personal computers to email, most communication technology has been introduced with a business function in mind, prior to becoming a part of our social lives. However, social media is a technological anomaly; private individuals quickly adopted this technology as an extension of their personal life without any previous introduction to it through their workplace. Due to this reversal, many organizations are struggling to understand how this technology can benefit their mission, while many more worry that it will devastate productivity and security. Individuals who wield the power of expansive social media networks can significantly alter an organization's credibility and fiscal health. Organizations who harness the massive data warehouses behind these social media networks have the ability to significantly alter individual lives and society at large; for better or worse. With this backdrop, what cultural barriers are being raised against social media adoption and how can management re-align their understanding of social media to better utilize resources and take advantage of the opportunities this technology presents?

PAVING THE WAY TO SOCIAL KNOWLEDGE

Paul Otlet envisioned a mechanized system of shared knowledge back in the early twentieth century (Rayward, 1975). As a peace activist, he

believed strongly in the transformative nature of freely sharing all of the world's knowledge as a way of bringing understanding across the globe. Mr. Otlet had conceived of a system of hyperlinks, which not only bound information together but also expanded on the understanding of the information by providing context. Unfortunately, given the era, the mechanism he envisioned was purely analog.

DOI: 10.4018/978-1-60960-203-1.ch006

Cultural Barriers to Organizational Social Media Adoption

This proved too significant a technological barrier for the system he designed to become reality.

Not quite a century later, you arrive at the modern digital world. In 1993, Tim Berners-Lee devised a system of hyperlinked documents that connect back and forth to each other, forming what he called the World Wide Web. Paul Otlet's vision had not been fully achieved but an incredible milestone had. The final component was to add context to the hyperlinks so that the information could be turned into social knowledge.

As we move beyond the second decade of the World Wide Web (aka Web 2.0 or the Social Web) the realization of context through a combination of metadata and machine awareness is starting to bear fruit. Websites like Facebook are using metadata and network awareness to provide suggestions to users for new friends with whom they might want to connect. Grocery stores are tracking spending habits and linking them to manufacturer coupons using complex algorithms to deliver coupons custom tailored to driving individual spending on higher end products. Search engines like Google are combining traditional indexing structures with social media networking data transfers to add further context to searches.

The network of machines that makes up our inter-connected world are, themselves, learning to understand our interactions better through context. The coming decades of this digital world should prove extraordinary in the history of technology. However, moving to a world of freely shared, contextual information has far more than a mere technological challenge to overcome. A world such as this has a terrific cultural barrier to overcome as well. Paul Otlet's vision was not just to create social knowledge but to extend it so far as to bring world peace. His utopian vision meant he faced an enormity of cultural barriers; some of which are being echoed here and now.

This chapter's vision is much more humble; to scale the cultural changes down to the organization. Creating a culture shift at this point should,

in fact, have global ramifications. Will this shift bring about world peace? Maybe not, but surely it will change the way we understand our world.

Within most organizations, there lies a wealth of information locked away due to both technological and cultural constraints. For the purpose of this chapter, cultural constraints are those organizational habits, leadership and management styles, policies and procedures that significantly hinder adoption of social media usage.

Through example, the following cultural barriers to embracing social media will be clearly defined:

- The desire to maintain a separation of personal and professional life.
- The fear of exposing oneself or one's efforts to scrutiny.
- The concern that use of social media will reduce productivity.
- The fear of new technology and remaining relevant.
- The security risk inherent in sharing information socially.
- The legal reporting requirements faced by some individuals and organizations.
- The flattening of organizational hierarchy and what that means for management.
- The loss of control over subordinates or project scope.
- The loss of competitive advantage.
- The overall fear of a Big Brother organization or society.

These cultural barriers will be explained in detail along side of current technological concerns. Here we will find both an opportunity to remove the barrier as well as examples of how this is already being done or might be done. As a result of removing those barriers we will discover opportunities for developing useful social knowledge.

Table 1.

Cultural Barrier	Underlying Problem		
	Fear of Reprisal	Transparency and Exposure	Loss of Control
Desire to maintain a separation of personal and professional life.	X	X	
Exposing oneself or ones' efforts to scrutiny.	X	X	
Use of social media will reduce productivity.	X		X
Remaining relevant after introduction of this technology.	X		
Inherent security risk in sharing information socially.		X	X
Reporting requirements and standards.		X	X
Flattening of organizational hierarchy.			X
Control over subordinates or project scope.	X		X
Protection of competitive advantage		X	X
Possible development of Big Brother entity	X	X	X

WHAT UNDERLYING PROBLEMS ARE PROMPTING THESE CULTURAL BARRIERS

In all cases, we see that these cultural barriers are an attempt at risk management; is the risk really there or is it merely perceived?

During the short lifespan of social media, we already have several examples of people losing employment, family and even their financial security due to over exposure through social media. Transparency issues, requirements for greater transparency as well as those for greater privacy have resulted in private and public institutions being forced to respond to expensive and embarrassing cases of exposure. Below is just such a case.

A case was brought before a Connecticut U.S. District Court about the firing of Emmett O'Brien High School English teacher Jeffrey Spanierman, aka Mr. Spiderman (Spanierman v. Hughes, 2008). This case highlights several risks that organizations and individuals face due to the highly transparent nature of social media use.

MySpace, a popular social media network, was being used by Mr. Spanierman as a way to communicate and connect with his students outside of the classroom. Using the MySpace profile name

“Mr. Spiderman”, his students were able to add him as their friend and see what he had posted; they could then respond if they chose to. Over time he had a long list of correspondence with his student MySpace friends. When his co-workers became aware of this they too reviewed his Mr. Spiderman MySpace profile.

The court documents recount that the Mr. Spiderman profile included pictures of naked men with, what the school guidance counselor Elizabeth Michaud claimed were “inappropriate comments” underneath them. After giving the teacher, an opportunity to remove the profile Ms. Michaud later discovered that Mr. Spanierman had setup a new profile “Apollo68” and continued his previous activities. Emmett O'Brien High School Principle Lisa Hylwa was then brought in to the discussion where Mr. Spanierman was eventually told that his teaching contract would not be renewed.

Mr. Spanierman claims that he had a right to use his MySpace profile both for his own personal pursuits as well as for communicating with students. The courts ultimately did not agree with him and his dismissal was upheld.

Coming to a resolution over this issue meant involving many individuals, from faculty to stu-

dents to administrators and eventually the courts. The facts surrounding the case are embarrassing at the least to the school system and damaging to the career of Mr. Spanierman. Questions were then raised by parents throughout the community of Ansonia, Connecticut about the health and safety of their children.

In the case above the school took the appropriate steps to resolve the situation. Unfortunately, it was a reactive solution instead of a preemptive one. Trust is easily lost. To maintain trust should organizations hide from social media? Should organizations cut their employees off from these interactions before these problems arise?

Schools, as in this case, have faced similar situations of inappropriate behavior between educators and students for as long as the two have existed. Social media networks do make it easier than ever for these sorts of inappropriate connections to be made. However, to suggest that this is merely an issue where removing the technology is the solution would be severely underestimating what is happening within our culture. Social media has become integral to many people's daily lives and removal of it would be tantamount to removal of phone access.

MySpace, among many other social media networks, provides individuals and organizations levels of exposure never before available. For example, MySpace rival Facebook boasts 400 million active users (Facebook 2010). The ability for so many people to connect to an individual's online content and repost that content creates a multiplication factor of previously unheard of proportions. This exponential reach is what presents us with both risk and opportunity and management needs to look for the opportunities to be found in this level of individual outreach. Those opportunities are often positive ways to mitigate the risks. The organizations that ignore social media are often the ones finding themselves blindsided.

United Airlines recently learned what sort of exponential reach individuals have online and what it means to their company's image due to an inci-

dent at O'Hare International Airport. A Canadian band, the Sons of Maxwell, was waiting to deplane to make a connecting flight. Prior to leaving their seats, they noticed the baggage handlers throwing their expensive musical instruments across the tarmac. The result of this mishandling was a severely damaged guitar. After several months of requesting a settlement from United Airlines, the company chose to deny the claims based on technicalities. The Sons of Maxwell then started recording songs and videos titled "United Breaks Guitars" which then went viral online with nearly 8 million views at the time of this writing (Carroll 2009).

United Airlines has since received international negative press coverage because of the band's viral videos. Due to this pressure, United Airlines promised to make reparations to the Sons of Maxwell and apologized for the incident. Where United Airlines has failed, Southwest Airlines has shined by expanding their customer service to the online world. Southwest Airlines hires agents to monitor social media networks looking for conversations and commentary about Southwest Airlines, offering assistance where possible and gratitude when positive comments are made. Southwest does this without a large public relations control structure by empowering their workforce to do the right thing.

Southwest Airline's customer satisfaction has been consistently high with a very low rate of complaints received by the US DOT compared to all other US airlines, particularly United Airlines (US DOT 2009). While this expansion into social media networks is not the sole factor in Southwest's high customer satisfaction it is one that has been closely examined by the competition. Over the past year many companies have come to recognize the opportunity for customer retention created by Southwest Airlines' social media efforts and are now following suit.

The power behind this customer service model is that the customer receives the help they need in the medium they choose and the help may

even come find them. This is in direct contrast to the frustration most customers feel as they are locked in a maze of phone support menus. Using sophisticated social media listening technologies, such as products like Radian6, an organization can actually discover people in need based on their content and then reach out to them directly to solve their problem. While this process is anything but informal it feels very much like it is informal because often the staff assigned with providing this support isn't traditional helpdesk or PR staff; it takes a broader base than that to cover this type of extensive, proactive outreach effort.

Social media users and particularly those considered "Digital Natives" have a great deal of comfort with these pseudo-informal processes that companies like Southwest Airlines are employing to maintain their organizations reputation. This is because they use these same sorts of strategies for maintaining their own reputations online. In the book *Born Digital* (Palfrey & Gasser 2008) the authors label Digital Natives as the younger generations who are growing up with no direct experience to the pre-internet enabled digital world. This always connected always sharing environment makes the Digital Natives comfortable with freely shared intellectual property, mass collaboration, decentralized leadership and broad transparency. This culture lends itself to creative problem solving and greater innovation – in all aspects of life.

Digital Natives particularly, but more broadly any social media innovators are taking advantage of these online cultural traits and using them to create products and solutions not because they are charged with some sort of traditional position of power to make these things happen; they are instead doing it based on a burning desire to see it happen and the free or cheap resources to do it.

Historically 3M has been a leader in supporting experimentation by its research employees, giving them time to work on projects they find personally interesting. A culture of innovation has been built at 3M. Nicknamed the "bootlegging policy", 3M

gives technical staff up to 15% of their work time on projects of their own choosing (3M Company 2009). When those projects look like they might have a marketable application 3M gives more time and resources; the company understands that innovation can come from unexpected places if you just let it. This is exactly how the ubiquitous Post-It Note came to be.

The importance of this is, even under the weight of highly vertical management structures, most research and development companies understand the value of exploration and experimentation as it comes to product design. In these niches of traditional organization structure, we can find the building blocks of what is happening in social media networks. Unfortunately, much of the rest of the business operations have been much more tightly scrutinized – even at 3M.

In traditionally managed organizations business staff members are often kept in job roles that become stagnant and inefficient due to the lack of opportunity for experimentation and innovation. Moving up the hierarchy of many organizations reveals layers of middle management that operate under this same culture. The nimble actions of on-line social media based startup companies are not only related to fewer marketplace responsibilities; it is much more about how they communicate, collaborate and innovate. An example of this is Twitter, which created the Twitter application as a convenient way for internal employees to communicate before realizing the greater market value of the Twitter application itself.

Unlike the passive "suggestion box" or the manipulative "workplace survey", organizations are finding real value when they allow workers and workgroups to realign based on a looser definition of job responsibilities. This is not to suggest that workloads are decreased or that a worker hired to analyze contracts does not have to continue analyzing contracts. Actually, expanding empowerment to work across groups will often mean greater workloads but the sense of empow-

erment and opportunity to follow personal desire and curiosity brings with it higher productivity.

Social media tools allow for broad collaboration to happen even in traditional management structures. These tools provide higher efficiency through ease of communication and the creation of searchable and linkable digital knowledge stores. A study completed by PennEnergy, in partnership with Microsoft and Accenture, found that a potential net loss of \$485,000,000.00 was occurring annually due to ineffective collaboration and knowledge transfer between oil and gas industry engineers (Microsoft 2009). The report surmised that through the use of better social media collaboration tools and implementing a culture of collaboration and sharing this net loss could be turned around.

Most management and shareholders see a major downside to the productivity and efficiency gains, namely a loss of direct control over intellectual property. As Kevin Kelly discusses in his e-book *Better than Free*, the Internet is a copy machine and once something is made available online it is impossible to ensure it won't be shared indiscriminately (Kelly 2008).

Freely shared intellectual property has resulted in an explosion of cheap components and products; even if (or especially when) that sharing was done illegally. Will the sharing culture that is so engrained in social media cause a dramatic shift in how we realize value or will the historical culture of patents, trademarks and copyrights remain viable?

The current thinking is that anything that can be experienced digitally will become free, not due to intellectual property "theft" but due to the fact that there is such an abundance of computing power, individuals willing to do knowledge work for free, project collaboration and the resulting innovation. Chris Anderson, editor of *Wired* magazine, talks about this "freeconomy" as being more of a transactional ecosystem than a one-way seller to buyer market (Anderson 2009).

Social media functions because of the idea of sharing: thus the "social" in social media. This sharing, or free culture, as described by Creative Commons Licensing creator Lawrence Lessig in his book of the same name, is one where intellectual property retains value but how that value is realized changes. Intellectual property should be made free when it expands the greater good through creativity and innovation and he further argues that this has often (sometimes inadvertently) been the case throughout history (Lessig 2004). Because digital technologies have prompted this shift across so many industries, it is more controversial now than ever before.

No single company has been in the crosshairs of this conversation and controversy as much as Google. Google's mission is to organize the world's information and make it universally accessible and useful (Google 2009). The company provides a vast array of services for free to individuals and pays for them through a combination of advertising and selling similar services to enterprises.

One such controversial service is the online publication of orphaned works of media and the plan to offer all copyrighted publications. Google has scanned over 10 million books into a digital format and is making them available in different formats based on copyright and partnership agreements. The access that Google is providing for free has been attacked as being a theft of intellectual property and has been pursued in Federal court (Google 2010). News services similarly argue that the aggregation of their content by search engines such as Google is both a theft of their intellectual property and damaging to their ad revenue due to fewer direct website visits.

In an attempt to refine its value proposition with its online and offline readership the newspaper *The Columbus Dispatch* has taken to using a red label in its newspaper to designate "Only in the Dispatch" exclusive content (Columbus Dispatch 2010). Sadly, much of the response to this transparency about what the Dispatch creates is that

the Dispatch doesn't provide that much unique content. Many users have commented more about how much content from the AP and other news outlets the Dispatch is printing; content already available elsewhere. Attempting to maintain your position can prove to be as risky as attempting innovation in this social media networked world.

Another controversial aspect of Google and similar companies is the technology behind targeted advertising. The technology that targets the advertising so well as to allow for this type of business model to succeed requires a vast data warehouse of users' online activities; social media use, searching, etc. One possible culmination of all of this sharing, collaboration and transparency is the building of digital DNA, the make up of who individuals are online and its connection to their offline life.

Several projects are underway right now trying to understand this concept of digital DNA, digital fingerprints and other essential identifying factors to connect individuals online and offline personas. One such project that is currently up and running through the Electronic Frontier Foundation (EFF) is titled Panopticlick (Electronic Frontier Foundation 2010). Panopticlick uses data leaks from web browsers, cookies and plug-ins to capture unique information about the system itself and the users browsing habits to develop a digital fingerprint that can be traced.

This leads to one final consideration; how organizations become, or contribute to, a big brother society. What does this mean to citizens, clients and competitive advantage? Industry operates as the last bastion of privacy in many of the developed nations. The transparency forced upon governments and being regularly adopted by individuals simply through the embrace of social media networks has not reached most private organizations.

Will the rapid adoption of social media culture by the general public lead to private organizations becoming more transparent; will it lead to a private

big brother state or will transparency be forced upon them through citizen (or consumer) action?

REMOVING THE BARRIERS TO OPPORTUNITY

The use of social media networks such as Facebook, MySpace and Twitter has created an interesting dichotomy of online persona. On one hand are the very personal relationships in what we used to consider our private life; on the other are the public expressions of those personal relationships and the unforgiving persistence of data in the digital world.

Of interest is the amount of data and artifacts surfacing within the digital world. Digital cameras, cell phones, and the like feed the digital world directly but as the attraction to social media grows to further outlying groups, who are not early or mainstream adopters of digital technology the digitizing of historical analog data is exploding.

According to an IDC forecast the digital world is exploding in size – to the tune of 281 Exabytes in 2007 growing towards 1800 Exabytes by 2011 (Gantz, Chute, Manfrediz, Minton, Reinsel, Schlichting & Toncheva 2008). For comparison, one Exabyte is the equivalent of 1 Billion Gigabytes.

Considering that organizations such as the Bibliotheque nationale de France has been digitizing its public domain documents for 10 years as a part of the much larger implementation of a Europe wide digital library (www.europeana.eu) the amount of historical data comes into focus. On a more personal level, photographs from grade school and even details of long forgotten relationships gone awry have found their way into the digital world. Efforts to bring the past into the hyperlinked and searchable present are occurring all around the world.

Within the United States, the prevailing cultural norm has been to expect some level of privacy within your personal life. This is the basis of several of our laws related to technology and to

healthcare. However, considering the amount of data an individual creates or is linked to on a daily basis it is difficult to imagine any real amount of privacy - even when you are not explicitly participating.

By explicitly cultivating an online persona, whether for private use or professional use, there must be no expectation of privacy. As we push to utilize these same tools within our community and professional organizations, a bigger question arises: is it beneficial to try and separate our private online persona from our professional?

In our earlier example of Mr. Spanierman, there could be some debate as to whether the school would have still found the case controversial had he been posting the pictures of naked men and adult commentary to a personal profile while conducting his connection with his students through a separate profile; one specifically intended for such communications.

Most social media networks allow for users to maintain multiple profiles if they so desire. Conceptually, maintaining a split personality in the digital world is not considered a disorder like it is in the physical world. In the physical world, this split is impossible. Some people maintain a level of separation between their professional and personal life in the physical domain but there is always overlap. And, it is the overlap that helps to move careers forward; it is that networking that occurs around personal passions that develop the most productive connections.

What we are learning about the digital world is that limiting separation can be much more productive. Growing your social network online or off requires making connections to people who have some similarity to you; a shared experience, a similar goal or perhaps a similar background. Historically this has been accomplished by attending social functions, choosing a specific neighborhood to live in and by presenting yourself in an appropriately conforming way. Digitally accomplishing the same thing requires participating in certain social media networks and participating

in those networks in such a way that you present yourself positively and accurately.

In an attempt to create greater trust between “friends” in social media networks Facebook, LinkedIn and others have used policy and culture to try and steer users to maintaining connections only to other users that they are already familiar with. In an article for *The Economist*, Dr. Cameron Marlow found that the average number of “friends” on Facebook was approximately 120, which falls below the Dunbar Number – a hypothesis by Dr. Robin Dunbar that the human brain can only manage a stable network of 150 or fewer connections (Marlow, 2009). In a study by Mitja Back of Johannes Gutenberg University, reported on by Bruce Bower for *Wired Magazine*, the researcher discovered that college age users of Facebook in the United States are very similar online as they are offline (Bower 2010). According to the article, “Facebook is so true to life, Back claims, that encountering a person there for the first time generally results in a more accurate personality appraisal than meeting face to face, going by the results of previous studies.”

This focus on trusted relationships has led to the wildly popular activity of Meet-up events. Meet-ups or, as they are called on Twitter, Tweet-ups are face to face networking events where your online persona crosses over to the physical world. Meet-up events often provide an excellent opportunity to collaborate on various community oriented projects, which then, in return, further increase both your physical world social capital and your online social capital.

For this reason individuals must become more aware of how living a combined life, public and private, physical and digital means that activities in one component has effects across all components. By choosing to maintain strong separation between these components severely limits opportunities because you have to limit your participation based on which personality you are reflecting at any given time.

Organizations who hire these highly networked individuals now have to consider the management of every employee as a potential spokesperson. This has been effective for Southwest Airlines and recently for retailer Best Buy. Best Buy launched an initiative they are calling Twelp Force (<http://twitter.com/twelpforce>). Best Buy is asking its employees to use Twitter to respond to customer questions and complaints “tweeted” to the @twelpforce account or found using various Twitter search tools.

Giving over 700 employees the green light to use social media networking at work may be a leap of faith but the company believes that the social knowledge of the Best Buy employees will provide customers with exceptional service worldwide that they otherwise would not be able to provide.

When this line blurs between personal and professional life in a highly networked social media environment, many organizations fear that productivity will drop and time management will falter. In response, many have chosen to block these applications all together. As we will discover, this is the wrong approach to take. As online personas grow and integrate into all facets of life, there becomes no or little distinction between personal and professional online persona. What follows is little to no distinction between personal and professional time.

The globalization of business has had a dramatic effect on how workers perceive what time they are on the clock and time that they are not. Management of schedules based on a 24-hour clock has been a struggle in the past; however, when employees and managers are allowed to function in a social media connected world not only can the scheduling issues be overcome but a previously unavailable advantage can be taken.

Social media collaboration tools can be used to dramatically increase productivity but they require a shift in how management interacts with employees, and how management understands the 24-hour clock.

In the pre-social media enabled world the most effective way of collaborating on projects was to work side by side, face to face and conduct meetings in that same fashion. The use of technology was considered a hindrance. Communication over time and space required physically being available at a particular location for a conference call, video conference or even early web-enabled conferencing. These technologies were expensive to use and while they provided the needed flexibility at the time, they were still a secondary solution.

Today tools allow for multiple streams of text, video, file sharing and collaborative data generation in real-time. Calling a meeting where all stakeholders are in the same room is now very often the secondary solution when all members are comfortable with the social media collaboration tools available to them. In many cases, even the idea of interacting in real-time is now a less advantageous use of technology. Instead of imagining an example where time and space are the primary factor in using online tools as opposed to a face to face meeting let’s consider the facilitation of a collaborative work meeting online, even with participants who work within the same building.

Using a collaborative technology such as Skype or Google Apps all members of the work group have the ability to talk via video conferencing and participants can drop in and out of the meeting as desired. During the conversation, they can quickly pull up files and share them with each other. Using social media collaborative document tools the documents, spreadsheets and presentation files can be edited by all participants in real-time together and new participants joining the conversation after the scheduled meeting time can continue to provide their input.

After the social media enabled meeting has ended you are left with ready-made artifacts, which are linkable and searchable, by everyone involved. The work can move forward immediately following the meeting without the need to distribute files and coordinate the ownership of those files. Management and workers alike can

instantly review who has made edits to the files, at what time, in what order and what changes occurred. Review notes can be tacked onto the files allowing for further discussion.

There is a learning curve to becoming comfortable with how these collaboration technologies deal with multiple real-time editors; this learning curve is a source of concern for management and workers not yet exposed to it. Most managers still feel that a face to face meeting is the most effective way to direct project activities.

Face-to-face meetings are very easy to command and control. The person calling the meeting generally has control over what data elements are interjected into the conversation and has removed participants from their work area where they have access to their own materials. By requiring people to disengage from their workspace, to physically come together in a room that doesn't provide them with the instant access to data available at their desk; you remove a level of empowerment that social media savvy workers thrive on.

A risk to those managers and workers who do not have a literacy of the social media collaboration tools being employed is that they may lose control of the meeting or control of what they believe is their domain of expertise. When a social media savvy employee is able to quickly link the data from across a broad range of work, it has the possibility of lowering the perceived value of those other employees.

The artifacts of face-to-face meetings are kept by the note takers who may then provide a static copy to the participants at some later date, once those notes have been transcribed into a suitable electronic format. Time spent waiting for participants, away from work areas, is often wasted time.

Remember, the context of this chapter is breaking through cultural roadblocks to using social media so it is important to understand that face to face meetings and other traditional methods can still be the appropriate process; this example is merely meant to expose the opportunity lost when

social media collaboration tools are completely removed from the meeting options.

Building camaraderie between management and workers or between work groups is often fostered in face-to-face settings. If you consider the meeting type itself as a technology, be it face to face or online, you can begin to understand which technology is most appropriate for certain goals.

Today there are even several face-to-face meeting technologies that align some of the positive attributes of social media enabled online meetings. Open Space technology is a meeting technique that allows the participants to build the meeting agenda to fit with what they see are the most important needs to the overall mission. Community Circle develops a stronger sense of equality across work-groups and the use of consensus can help move groups past struggles by forcing solutions instead of allowing roadblocks to stymie forward progress. World Café is another meeting technology that helps to walk large groups through a process of discovering new solutions by spreading ideas rapidly and giving them a chance to interconnect. All of these technologies are complemented by Harvesting technologies which are essentially collaborative note-taking techniques that link ideas instead of locking them down.

Harvesting can also feed social media content. Using social media collaboration tools provides an exceptional level of transparency, recording every transaction a user makes with the system, work done, and time and date stamps. Unfortunately, a natural component of this level of transparency can be scrutiny.

How many times have you had a coworker, staff member or supervisor who did not pull their weight within the organization? Working transparently provides workers who are well suited for their position an opportunity to shine while exposing those who might be better repositioned.

Organizations would benefit by using this transparency as an opportunity to better align the workforce with current duties (as well as finding new business opportunities). The result of this

re-alignment is an organization with increased productivity and greater innovation. However, if the organization chooses to use the transparency as a magnifying glass to scrutinize those workers the result will be higher turnover through low morale and ultimately lost opportunity. Thus, the challenge becomes finding the balance that encourages transparency as a route to positive change for employees.

The shift from single time zone, 12-hour daily coverage to the 24-hour work clock has left many organizations struggling to approach the cultural shift appropriately. Organizations now have a mixture of traditional workers expected to be present and productive at the physical workplace during certain hours as well as workers who are expected to cover needs occurring outside of that time frame. This mixture has created work environments where most levels of the organization, from line staff up through middle management, are fearful of being transparent about their work effort on any given day because of the possibility of transparency being used to scrutinize.

Vast differences in skill and experience related to using social media networks and tools have the ability to create fear within the workplace. Social media networks have presented the world with a sea change in how we interact, making it significant in terms of socio-technological shifts. However, from a standpoint of pure technology, this change is not unlike others we have seen in the past. Craftsman and laborers giving way to machines and robots, secretarial pools giving way to administrative assistants as desktop computing replaced Dictaphones and typewriters.

Transformation of business due to technological advancements occurs regularly and is more a case for change management than for derailment of an organization. Whether the technology provides cost savings through reduced work force or through reorganization is the discretion of the individual organization.

If an organization is looking at social media networks and collaboration tools solely for their

cost savings measures then they are missing a huge opportunity to harness the power of their shared social knowledge. It is this social knowledge that Paul Otlet recognized as a source of empowerment and organizations should embrace that as well. Empowered workers with a shared vision and mission can create amazing things.

By encouraging the use of social media networks the transparency and networking between workers and work groups allows skill sets to be brought to light that otherwise may have never been tapped. Building searchable and linkable data provides a path for sharing social knowledge across the broader organization, building the social knowledge that is so valuable.

Creating a forum for broad organizational collaboration and constructive criticism develops an internal validation and innovation system. The old adage about a fresh set of eyes holds true and the use of social media multiplies the number of fresh eyes you can get on any project.

As previously mentioned, a singular difference for social media over previous workplace technology advances is that it has been adopted first in the home and then transferred to the office, meaning it is much more accessible to the average person. Workplace adoption of new technologies historically has been staggered by generational differences. While the authors of *Born Digital* have taught us that the Digital Natives are at a distinct advantage, adoption of social media is rapidly crossing generational lines, removing this barrier.

One opportunity that exists for business is exploiting the new found social opportunities for individuals born well ahead of the digital era.

A primary source of fear related to generational differences and the technology is the fear of identity theft, or the theft of intellectual property. On a personal level this has the potential of ruining ones' financial security, at the organizational level this could be devastating both financially and to the organization's reputation.

Security has always been a combination of technology and culture. Secure passwords, cau-

Cultural Barriers to Organizational Social Media Adoption

tious browsing and guarded interaction online can be prompted by technological solutions but only work when users are in a cultural of awareness.

Young people in our society who are considered Digital Natives have grown up with literacy beyond that of what previous generations grew up with. Being literate in a digital world, a world of social media means that you must be able to critically discern between what is true and what is false; what is self-serving and what is more wholly accurate. Digital Immigrants, those of us born before the widespread adoption of the internet and its digital counterparts, have had to grow our understanding of literacy to meet this demand as well.

This new literacy also includes the understanding of how these technologies work. This informs the way that the literate interact with new technology including how they understand security. The prompting built into the technology has been, to the literate, like the prompting of an English teacher over the proper use of their, there and they're.

Over the long-term the adaptation of older workers to the life of a Digital Immigrant will better protect individuals and organizations through the spread of the new literacy. In the near future however, our more open use of social media could actually become our protection.

Remember the Panopticlick project and how it is learning about individuals and developing a digital fingerprint? In much the same way we can identify a close friend by sight, a computer may learn enough about our online persona to know when we are who we say we are - or not. The system will never be perfect; even today, con artists still work over their marks face to face; Bernie Madoff being a great current example (Wikipedia 2009).

Already systems are in place that record purchases made by an individual (using credit/debit card transaction information and/or in-store "shopper cards"). Individuals in most industrialized nations are captured on video systems mul-

iple times a day. Mobile phones have the ability to track our every move, record our voice/text/multi-media communications and record certain purchases. Mobile technologies are coming out that allow remote tracking of health devices such as Bluetooth enabled pace makers, etc.

A current MIT Media Lab project called Sixth-Sense that was conceived of by Pranav Mistry is still in its infancy but has the ability to recognize people and products. Working from that recognition the software then scans the internet for links related to that thing and provides the user what it believes is relevant information (Maes, Mistry 2009).

Include in all of this an individual's interaction (and possibly their friends' interactions related to the individual) on social networks and you can quickly conceive of a network recognizing whether the person buying gasoline in Kansas City is the individual they purport to be. At this point passwords and other current security protocols become much less significant.

For systems to engage people at that level there will need to be higher integration of current technologies, individuals will need to feel comfortable with that intimacy, and ultimately we will require new legislation to protect individuals from systematic abuse.

Currently the commonly named Sunshine Laws provide citizens in the United States with a level of government transparency. Other nations have similar protections while private organizations worldwide have far fewer requirements to act in a transparent way. Transparency laws, the policies that follow them and the individuals administering them, directly affect the cultural opinions of transparency based on how they administer those laws. Under the administration of President George W. Bush, most attempts to invoke transparency laws by watchdog groups were blocked by that administration. The national culture became one of skepticism over transparency and honest governance.

President Barack Obama's administration has put in place many efforts to increase access to government records; however, this fairly new shift means that the national culture remains skeptical over whether or not these actions are leading to a new level of government transparency. If administrators take a narrow view on transparency requirements then the public is right to be skeptical – the technology is there to provide broad transparency but the culture may not be. One solution being pushed by groups such as the Copy Left and Free Culture is to move society towards an Open Source standard.

Open Source technically refers to the General Public Licensing method that keeps software source code open, copy-able and edit-able by anyone who chooses to; the only requirement being that whatever they then create also must maintain those associate licensing rules. There are some variations of this including the earlier mentioned Creative Commons licensing. What is important though is the level of sharing of ideas inherent in this system and its unrelenting transparency.

Open Source as an ideal beyond software licensing suggests that all organizations should be fully transparent down to its nuts and bolts. The effect this has is to put individuals and organizations on more equal footing as social knowledge becomes freely transferrable.

The history of organizations has been one of providing data from worker to supervisor, and then disseminating the data from that point as management sees fit. Technology has similarly developed over the decades around this idea of hierarchy based workflow. Data moving through this type of system becomes a silo (or worse, standalone) which maintains the command and control structure of that now inefficient hierarchy.

The more rigid an organization's internal controls are for workflow the more likely that social media adoption is being fought. Opening up this data is a fundamental step towards changing the hierarchal culture.

Individuals have discovered the power of crowdsourcing through social media, exploiting the social knowledge on a very basic level, at home and in their communities. Crowdsourcing is essentially inviting hobbyists and experts to participate in solving a problem and creating something new. Crowdsourcing most frequently happens based on people's passions and less on immediate financial reward. Once again, the cost may include direct control over a project but social media savvy workers find crowdsourcing empowering and like to bring this very efficient way of learning and collaborating into their organizations; ultimately increasing organizational efficiency and innovation.

Utilizing social media as a way of building collaboration across organizations will help flatten hierarchy and will change the control structure over subordinates and projects. Here again we have an opportunity for public scrutiny which can provide an individual or organization with a chance to make significant changes.

While this public scrutiny may be seen as an assault on competitive advantage, looking at the internet development model suggests this isn't true. Goods and services are being crowdsourced online; that which can be freely used is, while those things that have actual value added are still being bought and sold.

Broad collaboration can provide superior goods and services than are available today. Wikipedia is an example of just this sort of thing. Not only is Wikipedia much more flexible (something detractors have claimed makes it untrustworthy) but Wikipedia has also been found to be as accurate as the venerable Encyclopedia Britannica (Giles 2005).

The opportunity for business then is to have the vision to see those goods and services to market in order to create profit. Competitive advantage in the future will be calculated more by the quality of the collaboration you can build than by the secrecy surrounding your product.

DOES THE FUTURE BELONG TO OTLET OR ORWELL

Functioning as an Open Source organization, one that allows for the full utilization of social knowledge has many advantages but is not without risk. If there is not a concerted effort to bring individuals, government and private sector organizations into a common set of guiding principles over transparency then we may introduce the risk of a long held fear.

The final cultural challenge is that of the Orwellian Big Brother state. While still broadly considered a fear of government dictatorial type control over citizens the (re)entry of private contractors into the police enforcement and defense market creates a growing fear of this same phenomenon happening via private sector. While that concern is the extreme consider how even low levels of tracking can introduce controls over personal habits that ultimately have very negative effects on individuals and society at large.

Massive data collection services are being utilized today by the private sector with relatively little oversight. The major credit bureaus have all sited that the information used to calculate credit scores as being confidential intellectual property as well as information about how your data is to be used by their clients. They market their services to a wide base of clients, from small businesses all the way up to the Federal government.

A glaring example of this questionable use is the recent housing bubble. During the creation of the housing bubble the banking system was hiring physicists and theoretical mathematicians to calculate new ways to take advantage of these pools of prospective mortgagors; the very same mortgagors that so many people have questioned how they were ever allowed to take out a revolving credit line, much less a mortgage. To find these individuals the corporations had to do a great deal of data mining; using the very data mines created by every individual just by being a part of our society.

Google, along with many other search engines and various telecommunications companies have been subpoenaed in the years following September 11, 2001 to provide the government with pools of data in attempts to protect against terrorism. As with any public safety issue there is a balancing act to make sure the safety goal is being achieved without injuring the rights of individuals. To verify that the balance is being kept requires open records to fully understand the process. Currently, however, we only know about these subpoenas through whistleblowers, as the efforts are considered confidential by the government and, as such, do not fall under the requirements of Sunshine Laws.

This raises the question: who owns the data that makes up an individual's online persona and who decides how that data can be used? The credit bureaus are some of the largest stores of personal information in the world and they claim ownership over that data. Using that premise, they create ratings about you as an individual and sell you (at least the digital equivalent of you) to anyone willing to pay for it.

One option for changing this dynamic is through radical transparency. Introduction of transparent processes and open source data resources at both public and private organizations would allow watchdog groups to be effective. However, in our current culture the lack of trust between individuals, private and public organizations may prove to be too large a gap to bridge.

Unfortunately, there is a growing economy in control of data that, in our capitalist society, almost assures that this lack of transparency will also grow until individuals decide that the risk to their digital identity is too large to continue down that path.

In the realm of non-profits, it is interesting to note that local and state governments are following the lead of the current federal administration and developing online tools to provide a greater level of transparency to their residents. Not all massive companies are opposed to Open Source

ideals. Google continues to expand their use of Open Source principles in products such as their Android operating system, Chrome browser and upcoming Chrome operating system. Google is one example of a company that is expanding its profitability and influence through this transparency. As an example of individual desire for greater transparency, companies such as Apple are suffering backlash from users over their closed-door policies – particularly as it relates to its software.

So is there a chance that the future will belong to the Paul Otlet's of the world? Perhaps.

Social media use by individuals appears to be penetrating organizations enough that our culture is leaning more and more towards sharing, at least in terms of data, intellectual property and the building of social knowledge. Before we can move towards Otlet's vision, we must organizationally embrace what individuals are already embracing.

These cultural issues are as important to reference and detail as the technology surrounding them. Technology alone, without cultural considerations, could well lead us closer to Orwell's vision than we would ever want to be.

IN THE END WHAT DO WE KNOW?

Using social media to grow, capture and reuse the social knowledge within organizations holds great potential for creating more efficient, innovative and successful organizations. The cultural barriers holding organizations back are not vastly different from the cultural barriers that held organizations back from previous technological advances.

The key to successful implementation and sustainability of social media in any organization is to realize that the cultural changes must be considered up front. Social media is merely a tool. Like any new tool, there is a necessary adjustment period where the user has to grow into a comfort level with it.

However, due to the exponential reach of social media and the associated responsibility

that comes with that, organizations cannot minimize the importance of creating a solid cultural foundation among their social media users. This foundation must include openness to sharing, a clear understanding of transparency, a desire to work collaboratively and a new literacy of understanding how social media works. Without this foundation organizations can expect to run over pitfalls that they might not be able to recover from.

Giving internal work groups, staff and even supporters the opportunity to engage each other about how social media could be utilized is a first step to building the culture necessary for success. There is a very good chance that many people within an organization already have ideas about how they could work more efficiently through the implementation of some social media tools – they just have not been asked to share those ideas. Worse yet your organization may be actively telling them not to share those ideas by shutting out access to social media and punishing employees using the tools. Organizations can foster this type of a culture through participant led cross-functional meetings where the experts (not necessarily the decision makers) can be discovered.

Using techniques such as Community Circle, World Café and Open Space creates face to face interactions that are more like the interactions that occur in healthy social media networks. By utilizing techniques such as these that remove hierarchy the true wisdom of the organization can be found. Social knowledge harvesting is ultimately the focus of these meetings, which can then provide content for the social media tools being used.

The capture of knowledge through social media allows for more than just quick reference, it also helps to build the internal network of your organization making stronger buy-in from all stakeholders. That is why social media networking is so attractive at the individual level – because it allows humans to be even more human by doing what comes naturally: embracing social connections. Together, we have learned that while

there are many pitfalls to avoid along the way to embracing social media the reward of navigating this cultural and technological shift appears to be well worth the risk.

Of course, this may not bring about world peace but it should make the future a little better in its own way.

REFERENCES

- Anderson, C. (2009). *Free: the future of a radical price*. New York: Hyperion.
- Bower, B. (2010). Wired Science Online: No Lie! Your Facebook Profile Is the Real You. Retrieved from <http://www.wired.com/wired-science/2010/02/no-lie-your-facebook-profile-is-the-real-you/>
- Carroll, D. (2009) United Breaks Guitars. Retrieved from <http://www.davecarrollmusic.com/story/united-breaks-guitars/>
- 3MCulture (2009). 3M – A Culture of Innovation. Retrieved from http://www.3m.com/us/office/postit/pastpresent/history_cu.html
- Dispatch, C. (2010). One of the Best Values Around – Only in the Dispatch. Retrieved from <http://www.dispatch.com/live/content/faq/exclusive.html>
- Electronic Frontier Foundation. (2010). Panopti-click. Retrieved from <https://panopti-click.eff.org/>
- Facebook (2010) Facebook Statistics. Retrieved from <http://www.facebook.com/press/info.php?statistics>
- Gantz, J. F., Chute, C., Manfrediz, A., Minton, S., Reinsel, D., Schlichting, W., & Toncheva, A. (2008). The Diverse and Exploding Digital Universe an Updated Forecast of Worldwide Information Growth Through 2011 [White paper]. Retrieved from <http://www.emc.com/collateral/analyst-reports/diverse-exploding-digital-universe.pdf>
- Giles, J. (2005) Nature International Weekly Journal of Science – Special Report: Internet encyclopedias go head to head. Retrieved from <http://www.nature.com/nature/journal/v438/n7070/full/438900a.html>
- Google. (2009). Corporate Information – Company Overview. Retrieved from <http://www.google.com/corporate/index.html>
- Google. (2010). Google Books Settlement Agreement. Retrieved from <http://books.google.com/googlebooks/agreement/faq.html>
- Kelly, K. (2008). Better Than Free [e-Book]. Retrieved from <http://changethis.com/search?action=search&query=better+than+free>
- Lessig, L. (2004). *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*. New York: The Penguin Press.
- Maes, P., & Mistry, P. (2009). Retrieved from TED talks – Pattie Maes and Pranav Mistry demo SixthSense. URL http://www.ted.com/talks/pattie_maes_demos_the_sixth_sense.html
- Marlow, D. C. (2009). Primates on Facebook. Retrieved from http://www.economist.com/sciencetechnology/displayStory.cfm?story_id=13176775
- Microsoft. (2009). Oil and Gas Pros View Social Media as Important for Productivity, Collaboration; Yet Few Firms Have Tools in Place, New Survey Reports. Retrieved from <http://www.microsoft.com/presspass/press/2009/feb09/02-18OGSocialMediaPR.mspx>
- Palfrey, J., & Gasser, U. (2008). *Born Digital: Understanding the First Generation of Digital Natives*. Cambridge, MA: Basic Books.
- Rayward, W. B. (1975). *The Universe of Information: The Work of Paul Otlet for Documentation and International Organisation*. Chicago, IL: University of Chicago.

Spanierman v. Hughes, No. 06-1196 (D. Conn. Sept. 16, 2008)

USDOT, Aviation Consumer Protection Division. (1998-2009). Air Travel Consumer Report. Retrieved from <http://airconsumer.dot.gov/reports/index.htm>

Wikipedia (2009). Bernard Madoff Encyclopedia Entry. Retrieved from URL http://en.wikipedia.org/wiki/Bernard_Madoff

ADDITIONAL READING

Brown, J., & Isaacs, D. (2005). *The World Café: Shaping Our Futures Through Conversations That Matter*. San Francisco, CA: Berrett-Koehler Publishers.

DiJulio, S., & Wood, A. (2009). Online Tactics & Success: An Examination of the Obama for America New Media Campaign. Retrieved from http://www.brainerd.org/downloads/Online_Tactics_and_Success.pdf

Jones, N. (2009). Gartner Blogs: Privacy and Geocrime. Retrieved from http://blogs.gartner.com/nick_jones/2009/08/11/privacy-and-geocrime/

Kelly, K. (2009). The New Socialism: Global Collectivist Society Is Coming Online. Retrieved from http://www.wired.com/culture/culturereviews/magazine/17-06/nep_newsocialism

Lessig, L. (2004). *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*. New York: The Penguin Press.

Locke, C., Levine, R., Searls, D., & Weinberger, D. (2001). *The Cluetrain Manifesto: The End of Business as Usual*. New York: Basic Books.

Miller, A. (2009). *Trust Management*. Retrieved from <http://andrew-miller.com/2009/03/trust-management/>

Owen, H. (1997). *Open Space Technology: A User's Guide*. San Francisco, CA: Barret-Koehler Publishers.

Palfrey, J., & Gasser, U. (2008). *Born Digital: Understanding the First Generation of Digital Natives*. Cambridge, MA: Basic Books.

Rayward, W. B. (1975). *The Universe of Information: The Work of Paul Otlet for Documentation and International Organisation*. Chicago, IL: University of Chicago.

Shirky, C. (2008). *Here comes Everybody: The Power of Organizing Without Organizations*. New York: The Penguin Press.

Thatchenkery, T. J., & Chowdhry, D. (2007). *Appreciative Inquiry and Knowledge Management: A Social Constructionist Perspective*. Northampton, MA: Edward Elgar Publishing.

Wheatley, M. J. (2002). *Turning to One Another: Simple Conversations to Restore Hope to the Future*. La Vergne, TN: Ingram Publishing Services.

Zittrain, J. (2009). *The Future of the Internet and How to Stop It*. London: Yale University Press.

KEY TERMS AND DEFINITIONS

Community Circle: A face to face meeting technique based on first nation style councils where a talking piece is employed and there is no designated leader. All members participate in note-taking using Harvesting techniques and consensus is used for decisions requiring that a party that disagrees with a course of action must offer an alternative until all parties come to some resolution - <http://www.artofhosting.org/thepractice/methods/circlepractise/>.

Copy Left: A movement to maintain a copyright with extra distribution rights that provide incentive for programmers to add to free software through alternative licensing solutions - <http://www.gnu.org/copyleft/>.

Creative Commons: A licensing scheme that enables the creator to keep a copyright while allowing certain uses of the work to further broader cultural creativity – <http://creativecommons.org>.

Crowdsourcing: Presenting a problem or scenario to a broad group of people so as to derive a solution from the wider perspective.

Digital DNA: All of the data that is connected to an individual and can be analyzed to learn more about that individual.

Digital Native: People who have never known a world without mass digital communications, particularly the internet and mobile phone technologies.

Digital Immigrant: People who have adapted to a world with mass digital communications but were raised during a period that analog technology was still the primary communications technology.

Free Culture: The cultural movement captured in a book of the same name by Lawrence Lessig that decry's much of the protection of intellectual property rights in favor of broadening the cultural impact of that intellectual property through free sharing of the ideas.

Freeconomy: An economy based on offering partial or complete services for free and relying on 3rd party forms of revenue generation developed from the existence of a large user base of the primary service.

Harvesting: A technique of note taking that allows every individual the opportunity to write or draw what they feel are the important ideas coming out of a conversation on a shared surface in the center of the conversation, or in some similar interactive way, ensuring that the main ideas of the conversation are not lost nor incorrectly interpreted - <http://www.artofhosting.org/thepractice/artofharvesting/>.

Machine Awareness: The ability for a digital machine or network of machines to process social interactions and provide a response based upon those interactions.

Meet-Ups/Tweet-Ups: Face to face networking events organized via online social media networks usually with some community activity planned as a component of the event.

Metadata: Contextual data that helps machines interpret data in a way that enables machine awareness.

Open Source: The use of licensing schemes that maintain open source code to software and hardware. The broader idea that all of the structure behind a system (either machine or human based) be transparent to both the operators and the users of that system - <http://www.opensource.org/>.

Open Space: A face to face meeting technique that uses a marketplace format with open time slots instead of a structured meeting agenda. The meeting participants are invited to fill those time slots with particular topics that they have a passion for that relate to the meeting's mission - <http://www.openspaceworld.org/>.

Radical Transparency: Broad transparency of digital data shared holistically across digital networks and devices as a way of fully connecting a person or organizations digital DNA.

Social Knowledge: Knowledge created by the members of a community of interest sharing individual and collective experiences, learning from each other and capturing those lessons.

Social Media Listening Technology: Technologies that learn patterns in a person or organizations social media usage patterns and provide reports based on where those patterns intersect with the intention of a particular person or organization. The technology is used to develop targeted advertising and engagement schemes.

Targeted Advertising: Advertising that is customized to a user based on information collected about the user's online activities.

Viral: Online content that becomes so popular so fast that it quickly spreads through social media networks.

World Café: A meeting technique that separates attendees into small groups to answer ques-

tions which purposefully lead a conversation about a larger organizational roadblock. Within each small group Harvesting is done during each round and group members change groups between rounds to spread ideas - <http://www.theworldcafe.com/>.

Chapter 7

Organizational Culture: A Pillar for Knowledge Management

Paul J. McBride
PhD Student, USA

ABSTRACT

This chapter describes how and why organizational culture is paramount towards endeavors of social knowledge and knowledge management systems. Previous literature is discussed and ideas presented to give an underlying understanding of organizational culture and knowledge management and how the two interact. It is argued that a culture based on honesty, trust, and openness is best suited for knowledge management. Cultures will ebb and flow as they evolve. It becomes important for managers to take notice when this occurs. Learning is essential to developing cultures as it molds the participants inside the organization. Organizations that employ social media to aid in culture development will build systems of knowledge management that are based on proper culture that will inevitably lead to competitive advantage.

INTRODUCTION

An organization's ability to learn, and translate that learning into action rapidly, is the ultimate competitive advantage.

-Jack Welch, Chairman, General Electric

Industry leaps of efficiencies are bringing companies closer to one another in effectiveness and strategy management that will inevitably lead to a war of attrition. Organizations are recognizing the strategic importance of social knowledge management within their respective firms to establish efficiencies inside firm practices. Many organizations have arrived at the conclusion that effective social knowledge management can enhance their competitive abilities (De Long and

DOI: 10.4018/978-1-60960-203-1.ch007

Fahey, 2000) and provide strategic advantages in the marketplace. However, to truly offer a sustainable advantage the advancement made from social knowledge management must add value. (Oliver, 1997) Once an implemented knowledge management system exhibits added value, it will offer the organization the ability to consistently outperform competition.

The value benefit of social knowledge management will branch from the ability of a firm to develop the proper organizational culture. Value benefit can best be defined as differences in strategy and structure across the firm that offers above-normal rates of return. (Oliver, 1997) Organizational culture is vital to a firm's success and performance as it is what leads activities that reinforce best practices. (Reed, Lemak, & Montgomery, 1996)

The adoption of knowledge management follows the seeking of technical efficiency gains and customization of practices that lead to unique business problem resolution. Organizational characteristics will lead firms to adopt stronger culture bearings, clearly needed for successful knowledge management ventures. Knowledge management will aid corporate leaders in allocating resources to areas that offer greater advantage and benefit, while staving off competition. This will effectively eliminate the root of business problems while enabling achievable performance. The allocation of firm resources, which include assets, capabilities, organizational processes, and firm attributes, (Barney, 1991 and Spender, 1996) will aid in outperforming rivals and establish clear distinctions that can be preserved.

Attention to customer requirements is supreme when environmental uncertainty is high. (Reed, Lemak, & Montgomery, 1996) When firms are market driven, their attention is focused on anticipating and responding to customers' needs and preempting those needed changes. (Reed, Lemak, & Montgomery, 1996) Knowledge management will aid in understanding environmental shifts inside and outside of the organization which will

reduce the elasticity of demand by the customer. (Reed, Lemak, & Montgomery, 1996) Improved revenues will be realized by a positional advantage made with the development of accessible knowledge management. It is the implementations of knowledge management that will allow firms to turn improved responsiveness into value priced items and services. It will further drive competitive advantage that comes directly from the abilities of the firm to develop goodwill with customers, distribution channels, lines of technology, and lines of communication, a positive reputation and many other benefits associated with channels of knowledge management. Firms, with the assistance of knowledge management networks, will take into consideration their relative competitive strengths. When stakes are escalated, the firm will allocate needed resources to knowledge management development. This allows firms to employ a decision-making process based on information seeking and information processing activities (Yu & Cannella, 2007) which aids in understanding the environment in which they interact.

The chapter will concentrate on the importance and pitfalls of organizational culture and its relationship within social knowledge management. Discussed within the chapter will be the evolution of culture around participants inside the firm and how those participants develop the assumptions and values they use. A short literature review and general descriptions of key terms are also included. The chapter will move into common assumptions about culture and knowledge management and will finish with future research implications and where the field of knowledge management is heading.

ORGANIZATIONAL CULTURE

Question: What are the three critical factors in knowledge management?

Answer: Culture, culture, culture

Organizational Culture

-Bob Buckman, president, chairman, and CEO of Bulab Holdings, Inc.

Authors and captains of industry alike develop lists that look different but undoubtedly they all will include one well known characteristic; organizational culture. Organizational Culture continues to be the single hardest aspect to see or unmistakably outline by those participating inside it. Organizational culture is expressed in many different ways that not one single viewpoint is consensually shared. Edward Schein defined organizational culture as:

A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to those problems. (Schein, 1984, pp. 12)

Clyde Kluckhohn defined culture as “the set of habitual and traditional ways of thinking, feeling, and reacting that are characteristic of the ways a particular society meets its problems at a particular point in time” (Serpa, 1985, 426) and Deal and Kennedy (1982, P.4) simply defined culture as “the way things get done around here”. All are correct, distinctive in nature, and inclusive. (Schein, 1986)

Culture, as seen every day, can be a cloudy feature experienced and still the most difficult practice to encapsulate with agreed upon definitions. (Goffee & Jones, 1998) What is exceptional about culture is that everyone is aware of it but generally find it difficult to describe in consistent terms. We have all experienced within our lives an element of culture either in work, school, or a social club. It is equivalent to gravity as it governs everyday life and is ultimately inescapable. Organizational culture is what a new employee feels when they interview and is offered a position. It is the first thing they understand when a

fellow employee lays out the tacit “rules of firm survival”.

CEOs of companies praise culture and its existence and have blamed it for slumping profits and obsolete product lines. It is considered extremely valuable to organizations and almost always taken advantage of. The culture will direct upper management in outlining mergers and how to raise corporate finance while also aiding the floor level supervisor on disciplinary measures. Many studies report that one single aspect of firm behavior that has led to failure of the firm is the misuse of organizational culture. (Cameron & Quinn, 2006) There are many models associated with organizational culture, evolution of culture, and the change of culture and most include values, norms, and practices inside their descriptions and how to assess and evaluate the use of them. It is the most powerful force inside an organization but can't be measured similarly to balance sheet ratios or new functional pieces of equipment. It is the blood line of any organization and can sink a firm without notice. Employees learn how to interact inside culture and pass that learning on to new hires. Additionally, there are struggles over culture as actors inside organizations fight to change or uphold the culture in place. So there must be something to culture that does so many things without being granularly defined.

Unlike other management frameworks, organizational culture is relatively new in management understanding. As powerful and responsible as organizational culture is in defining a firm, it has only become a popular subject within management circles during the 1980s. (Hatch, 1993) Although the “social glue” of organizations has been evolving over many decades, its true observed value and acceptance are only recently acknowledged. (Serpa, 1985) During the first stages of organizational culture, bureaucracies were the initial focus as they exhibited size and popularity. Companies that were larger were more noticeable due to larger market shares and exposure to public opinion. Additionally with more players inside

the larger organizations there were more factions and personality intermingling that brought about new developing cultures. This soon was replaced with more companies of larger growth moving through many separate sagas. (Pettigrew, 1979) While the movement was rapid, cultures evolved into what they are today inside their respective firms. Every company today may have a culture in place that may be best described as dynamic, friendly, suffocating, or drab. They are essentially the personality of the organization and can be expressed on many different levels from the shop floor to the executive offices.

KNOWLEDGE MANAGEMENT

There is a modern day explosion of knowledge due to technological advancements that make it possible to access large amounts of information instantaneously. Recent management gurus such as Daniel Bell and Peter Drucker are making organizations aware of the value of lost, unused, unnoticed, or inaccessible knowledge. (O'Dell and Grayson, 1998) Although organizations are realizing the importance of knowledge, there is still some confusion concerning information and its role in knowledge development.

Knowledge management doesn't even start with technology. It starts with business objectives and process and a recognition of the need to share information. Knowledge management is nothing more than managing information flow, getting the right information to the people who need it so that they can act on it quickly....information is a verb, not a static noun. And knowledge management is a means, not an end. (Gates, 1999, p. 238-239)

O'Dell and Grayson (1998) share a similar view to Bill Gates when they describe knowledge as "information in action"; using the knowledge to better the business situation. It is the developed knowledge put into action that benefits organi-

zations. It is the correct knowledge becoming actionable in the right set of hands. Ideas become implemented based on facts gathered in a network aimed at leveraging new learning to gain a competitive advantage towards the betterment of the organization. Knowledge management is more than a sales pitch or buzz word, it is using what an organization knows and basing judgment and decisions on experiences and understanding by organizational participants. (Ruggles, 1998)

Recently organizations began to consider themselves a compilation of knowledge and the activities around it. (Spender, 1996) Organizations now delve into knowledge management frameworks in order to share information, develop avenues of better decision making, launch new innovation, develop quick and efficient problem resolution systems, and the development of best practices. (Alavi, Kayworth, and Leidner, 2006) Firms must successfully develop systems of knowledge that build an "*absorptive capacity*" by using prior knowledge to spawn new acquired knowledge. (Gold, Malhotra, and Segars, 2001) The information inside knowledge can be captured in many different forms but mostly resides inside the minds of the individuals in the organization and developed through experience and understanding of the environment around them. Although most knowledge matrices are engrossed with data, it is the experiences and understanding that prove truly valuable to the organization, making it imperative that organizations become knowledge-based to take full benefit.

New knowledge begins at the grass roots with the individuals inside an organization. (Nonaka, 1991/1998) How a company finds the value in the knowledge is by making it accessible to those inside the organization.

The general understanding among academicians of knowledge management is that knowledge will progress through three distinct levels of hierarchical importance; those being data, information, and knowledge. (Girard, 2004) This becomes an umbrella concept as those who practice business

Organizational Culture

in differing organizations may label the levels in other ways but will normally include the three mentioned inside their platform of knowledge management. There are some levels of disagreement with hierarchal pyramids concerning knowledge development but a consensus exists that the progression towards knowledge acquisition will flow from data to knowledge.

Knowledge creation may progress through four distinct avenues; those being from tacit to tacit, from explicit to explicit, from tacit to explicit, and from explicit to tacit. Tacit to tacit knowledge is exhibited through on-the-job training, storytelling, and observation. This level of knowledge development is sometimes referred to as socialization and is displayed in the work setting as a mentor/apprentice relationship. The employee will learn a trade or task and eventually train it out to someone else. Explicit to explicit knowledge development occurs through formal education, data, and read documentation. It can be seen through work manuals and is largely called combination. Tacit to explicit knowledge development occurs through descriptive means such as metaphors and analogies. Tacit to explicit knowledge occurs through a piece of knowledge further developed into a new form that is easily understood through the new development. The externalization of this process can be exhibited by a new surgeon further developing old techniques. The final form, explicit to tacit, is called internalization and is brought about by simulations and experiences. The master will further develop an understanding based on knowledge acquirement. These techniques working in conjunction simulate a spiral of knowledge. (Nonaka, 1991/1998 and Girard, 2004) The spiral of knowledge will move through all four stages of knowledge creation and eventually work back to its beginnings.

The four concepts of knowledge creation need not operate in isolation.... Imagine the middle manager that patiently observes executives at work. Through socialization, she slowly learns the inner

working of the boardroom. In an effort to formalize her knowledge, she articulates or externalizes the executives' ideas into a series of procedures based on economics principles. By combining the codified procedures of several managers, she develops and documents new concepts. Finally, she presents these new concepts to a number of managers, perhaps at a conference, and they internalize the ideas and create even better ways of affecting their technique and thereby creating a competitive advantage. At this point, the process may recommence. (Girard, 2004, p.31)

The spiral of knowledge will further develop knowledge by bringing the learning back again but at a higher, more developed level. New knowledge creation begins as much from ideals as it does from an individual's ideas. (Nonaka, 1991/1998) Organizations that foster this mentality will essentially turn all employees into knowledge technicians.

ORGANIZATIONAL CULTURES SET FOR SOCIAL KNOWLEDGE DEVELOPMENT

A firm's most significant roadblock to effective knowledge management is its culture. (Gold, Malhotra, and Segars, 2001) As organizational models are predicated on many separate aspects, there is no exact model that fits all organizations. When a culture becomes based on knowledge sharing there are a number of factors that are built inside that culture. The values most quoted by recent studies are sharing, honesty, openness, and trust. These will enable a higher level of innovation and efficiency building inside the organization. (Alavi, Kayworth, and Leidner, 2006) Honesty, trust and openness are essential to an organizational culture geared towards knowledge sharing.

Delong and Fahey identifies specific value orientations believed to facilitate or hinder knowledge sharing. They argue that value orientations such

as trust and collaboration will lead to greater willingness among firm members to share insights and expertise with each other. In contrast, value systems that emphasize individual power and competition among firm members will lead to knowledge hoarding behaviors. (Alavi, Kayworth, and Leidner, 2006, p. 196)

Unfortunately a number of organizations are replete with individuals practicing disingenuous methods towards business practices. When participants inside organizations begin to repress “bad news” (Serpa, 1985), call one-on-one meetings outside of larger meetings, and carry out a level of groupthink it becomes vital that the management take notice. The culture that includes these practices is not equipped for knowledge management. (Serpa, 1985) Individuals inside organizations involved with groupthink tend to be averse to new, dynamic ideas. There is no collective judgment from the group, only a central theme brought by one member or faction. What usually occurs is a tendency for a member’s response to gravitate towards a central idea brought through group discussion generally restricted by an agenda bent on control. (Whyte, 1989)

Social knowledge depends heavily on social meetings and social media. Social media aids participants in understanding the knowledge the company wishes to capture and develop. When one thinks of media they first envision television, newspapers, or radio spots generally offering some sort of information for the viewer, reader, or listener. Although social media is similar its aim is slightly different than popular forms of media. Social media is directed towards smaller groups of participants; smaller at time of interaction. It is a tool to get those using it to speak of it and develop it further within their every day vernacular; making it part of the culture.

Social media, on the surface, sounds similar to groups think as they are both used to develop interaction between groups to share knowledge. Where groupthink runs amiss is that the group

gains insight to only one opinion and are steered to agree with that prime mover. Knowledge sharing is not encouraged and considered disagreement as members inside organizations employing groupthink hold on to knowledge as a form of currency.

Groups can sometimes be mired down with a centralized structure of information pass down. Although it is important for a core information depository, ideas and new learning must be started and shared in a decentralized manner. Organizations find the most effective way for social media is to find success when employees display autonomy inside their group or individual settings. (Janz and Prasarnphanich, 2003) The sharing of knowledge becomes second nature inside organizations that offer the feel and approach shown through a localized structure of lateral communication effectiveness. (Miles & Snow, 1992) The decentralized setting enables employees to sense a level of empowerment that influence a creative nature towards cooperative learning and collaboration. They begin to share more of what they learn which in turn will build an additional knowledge base and further develop the culture set towards true knowledge sharing. Collaboration, as it takes place between individuals and organizational actors inside and outside the walls of the firm, will bring together differences that are essential to driving knowledge creation and removing groupthink. (Gold, Malhotra, and Segars, 2001) Furthermore, processes used for conversion and application of knowledge must be put in place to make better use of the effort of knowledge sharing.

The Evolution of Culture

Organizational culture is a set of shared mental assumptions that guide interpretation and action in organizations by defining appropriate behaviors and norms for various situations. (Jarvenpaa and Staples, 2001) A person’s past learning and belief structure is essential to shaping the practices and vision of the organization. The learning described,

Organizational Culture

coupled with others inside the firm, will draft the culture to be and define the practiced behavior. It is the organizational culture that principally deals with the internal workings of an organization and it is its identity that interacts with the external environment. The learning is associated with reinforcement that comes from avoidance of experiences that are not the most pleasant. (Schein, 1986) Anxiety replaces the most perspicuous actions until reinstated with an underlying culture brought by participants of the environment. The survival of the culture solely depends upon the players inside the organization and the culture espoused and grown through the organizational identity.

Organizational Identity

Organizational Identity can be exhibited in the form of projected images, new slogans, new vision and mission statements, logos, or corporate mottos. Organizational Identity can be either physical or linguistic artifacts and are geared towards persuasion of employees and outsiders to the organization and the culture within. These projected images can be destructive, when not aligned to what an organization is attempting to accomplish; especially when they do not agree with the culture. Organizational identity aids participants in their respective organizations to make some level of understanding of what they are accomplishing or attempting to do. Participants will continue to develop and uphold institutional claims based on interactions with those inside their organization. (Ravasi and Schultz, 2006) With the identity taking root, participants further solidify these surface-level behaviors with additional interpretation and eventually assigned meaning. It is this assigned meaning that should be used to aid in outlining the culture moving forward.

Artifacts are important symbols of the burgeoning organizational culture taking hold. When you enter a business it is the artifacts that are visually seen or audibly heard that alert one of the culture

in place. Artifacts begin the evolution of organizational culture and launch social media to the participants. It is imperative that the social media is correctly aligned with where the organization wishes to develop their employees and the interactions that will make up that culture. Generally encouraging posters and important quoted statements begin the new employee, existing employee, or visitor upon the journey into the culture. Organizational artifacts make up the surface level of its Cultural dynamics. (Hatch, 1993)

Theories Practiced

An organization's culture is built through the employee's practice of espoused theories and theories-in-use. These terms were made popular by Chris Argyris and Donald Schon during their exploration of congruence and learning inside the examination of reasoning processes through conscience and unconscious means. Espoused theories justify a given pattern of activity by outlining the general practices of the organizational participants. They are used to convey to others what an organization does, what they want others to think they do, and how they perform. Espoused theories are strongly associated with the evolution of the culture. Additionally they can be formative of the culture as they springboard the vision moving forward.

During Buckman Laboratories' journey to becoming a knowledge management champion they espoused their need for the development and use of an electronic network that will allow the company to be driven to offer access to needed information that included best practices, experiences and skills. Buckman Laboratories endeavored to have essential knowledge branched out to all 1,200 associates worldwide; a huge undertaking but an essential belief and espoused theory that took hold and evolved the organization. (O'Dell and Grayson, 1998) This collaboration effort made associates share the IQ of the complete organization and thus pushed the "Buckman

Knowledge” network, named K’Netix, exponentially into a system of competitive advantage. The espoused theories efforts that govern Buckman Laboratories are clearly spelled out in the ethics given through their knowledge sharing oriented culture. It is this collaborative nature that will set the stage for true knowledge management to occur and be successful. Without the culture to set a mindset towards collaborative effort, the organization becomes stagnant as groups now become employees working inside informational silos. Becoming consternated to share what they know while holding on to knowledge-perceiving it to be power. By building these communities of practice, people gel into a coherent group geared towards achievement of business goals through sharing organizational interests and knowledge. (Galbraith, Downey, and Kates, 2002)

When individuals perform differently than the espoused theories they are exercising theories-in-use. While the theories-in-use are really how the organization practices, it is the theory-in-use that must be constructed through observable patterns of interactive behavior. It is imperative that both align through behavioral adjustments by players inside the organization. (Argyris & Schon, 1996) Theories-in-use generally bring trade-offs between participants’ norms and values and the outlined organizational culture. Inside the expressed differences lie action strategies and consequences. Acceptable ranges must be set and enforced with consequences giving through a coherent guide for participant behavior. (Ravasi and Schultz, 2006) The behavior of the individual members should be governed by a set of formalized rules. Although this forces a semi-rigid model, learning inside that model will involve detection and correction of error geared towards defining noted disparities that will set in motion a level of inquiry towards resolution of adjusted behavior. Unchecked theories-in-use could further develop assumptions that may lead to manifestations of new cultures.

When a solution to a problem works repeatedly, it comes to be taken for granted. What was once a hypothesis, supported by only a hunch or value, comes gradually to be treated as a reality. We come to believe that nature really works this way.What I am calling basic assumptions are congruent with what Argyris has identified as “theories-in-use,” the implicit assumptions that actually guide behavior....Basic assumptions, like theories-in-use, tend to be nonconfrontable and nondebtable....Clearly, such unconscious assumptions can distort data. (Schein, 1985, p. 18)

The assumptions will undergird values of the organization and push the culture needle towards new paradigms. The new paradigms may be deleterious to what the organization is wishing to accomplish.

Organizational Learning

Inside organizational culture are individual players who are designing and molding the culture. They interact with one another and actors outside of the organization. The players renegotiate shared understandings with one another on what the organization truly stands for. (Ravasi and Schultz, 2006) While performing in this manner, institutional claims and collective understandings are being developed in a juxtaposition to the above espoused theories and theories-in-use. As those two concepts are set for larger groups, individuals also set opposing cultural underpinnings within themselves. Identity claims and identity recognition are important to understand as they outline the culture at large through additional organizational learning.

“Rising competitive pressures have fueled interest in organizational learning as a major determinant of sustainable organizational performance, which suggests that to survive and thrive; firms will need to learn at an increasingly rapid rate.” (Rousseau, 1997, p. 530) Many scholars today consider organizational learning imperative to stave

Organizational Culture

off outside pressure and to adapt to environmental constraints all the while building the organizational culture. (Barkai and Samuel, 2005) It is important to understand that organizations learn in a similar manner as individuals and process information in order to produce knowledge. Organizations and individuals both learn through applications that are geared to offer changing states of information into actionable learning. Change in states of raw information can be accomplished through single-loop learning and double-loop learning.

Single-loop learning is mediated by organizational inquiry that attempts to connect detected error. The strategies will undoubtedly be modified to align with corporate norms and values; in essence always keeping them the same. The participant sees small differences and makes changes based on their experience and understandings. There is nothing centrally wrong with this approach, but it only involves auxiliary methods that do not rely on understanding the underlying factors by simply focusing on symptoms of the problems. (Chinowsky & Carrillo, 2007) Organizations find themselves programmed on a schedule of prior capabilities by only monitoring environments and drawing solutions from already developed resolutions. The assumptions, values, and norms of the group involved will generally stay the same. Single-loop learning is sufficient where error correction can proceed by simply changing organizational strategies. (Argyris & Schon, 1996) It is double-loop learning that is needed and used by individuals or groups when they address the desirability of the values and norms that govern their theories-in-use (Argyris & Schon, 1996).

Double-loop learning will force the norms and values of the corporation to be changed and outlined with new strategies, always taking the group forward to engage one another. Here participants examine the underlying factors and make systematic changes to push the culture along to new paradigms. Root cause to issues is sought by viewing symptoms and underlying indicators to larger problems, thus development a proactive

approach to issue resolution. Participants develop understanding toward the assumptions, values, and norms and change them according to larger payoffs. Double loop learning becomes a reflection of how participants inside the organization think, showing their reasoning behind their actions. (Argyris, 1991/1998) This expounds the employee's theory in use and will make an employee aware of the large inconsistency with their espoused theories. Participants who discover their inconsistencies with theory use normally follow a short list of four basic core values when surrendering to theories in use. That list will include:

1. To remain in unilateral control;
2. To maximize "winning" and minimizing "losing"
3. To suppress negative feelings; and
4. To be as "rational" as possible-by which people mean defining clear objectives and evaluating their behavior in terms of whether or not they have achieved them. (Argyris, 1991/1998, pp. 92)

Closed loop learning is destructive to the culture and will always destroy attempts to build knowledge sharing and knowledge development.

The situation in learning can be adjusted by a change agent who sets change that inevitably leads to additional modifications inside the organization. The properties of understanding the situation are only transactional, as doubt and fear provide supplementary understanding. This will be followed by cyclical doubt and fear as the participant changes and responds to the new environmental cues. Dewey states Inquiry "does not merely remove doubt by recurrence to a prior adaptive integration but institutes new environmental conditions that occasion a new problem". (Argyris & Schon, 1996, pp. 31) In the language of Deweyan Inquiry, there is no such thing as "final settlement". Inquiry is to be tested by its success in resolving a problematic situation and by the value inquirers come to attribute to the

new problems their resolution creates. (Argyris & Schon, 1996) The inquiry will aid in developing new skills and learning new ways to adapt to challenges and new social situations. In addition, those resolutions may require further adjustments in the attitude and behavior of many people across diverse lines such as political, ethnic, religious, and socioeconomic boundaries. (Heifetz, Kania & Kramer, 2004) Evolution in this manner is prevalent inside organizations today. Social media and the front it develops and enables are imperative to keeping the organization on track. It can only be accomplished by well-developed and matured organizational cultural settings.

FUTURE RESEARCH

Large strides are being made in business practices today concerning monitoring of knowledge development, knowledge building, and knowledge sharing. Unfortunately, employees are not enamored with the practices needed to obtain knowledge sources and development. "Surveillance tends to undermine the very behavior that monitoring is trying to induce or ensure." (Jarvenpaa & Staples, 2001, p. 175) With the onset of knowledge sharing, surveillance systems must be adjusted to allow such activities to exist. Although companies are stressing to share they must make participants of firm knowledge understand where the sharing line is drawn and not fall into the trap of external motivation. This is accomplished through internal motivation but hard to capture if the right strategies aren't engaged. Managers will need to ascertain the proper motivational agent to make the change long term and tie in with the evaluation and compensation structure. (Davenport, De Long, & Beers, 1998) If employees feel comfortable and are rewarded to their satisfaction, knowledge management can be successful. Employees will again feel a part of the organization and identify with the culture in place.

With the advent of knowledge management systems and the ever increasing technological advancements, organizations will need to set systems in place to acquire knowledge sharing across many diverse ranges that include culture, distance, and language. Organizations are increasingly becoming global; information can be lost bridging the gaps. Managers must ask themselves if the knowledge developed in one region is important to another. If product lines are similar or customer needs branch across different regions or expertise is finally reaching another portion of a particular region, that information must be shared. Regions that have large amounts of cultural centers may exist elsewhere and will need that knowledge expertise to engage. These are all reasons that must be discussed when attempting to develop systems to capture and build the knowledge.

A very large single factor to knowledge management destruction is the loss of organizational memory. This occurs when employees decide to leave an employer or are removed. Within every employee movement, there is an amount of knowledge escaping the firm. Employees change jobs, change fields of expertise, and are sometimes downsized in today's work environment. This makes it increasingly difficult for employers to hold on to proprietary knowledge, let alone the institutional expertise that is lost during turnover. What's more is a large amount of work is outsourced to temporary employees. When a temporary employee finishes an assignment, that employee leaves with that piece of organizational knowledge. (Stoyko, 2009) Employers must grant access to organizational knowledge in order to advance the knowledge base but to capture what has been advanced is difficult at best. Exit interviews and confidentiality agreements attempt to keep knowledge from escaping to external organizations but a system to retrieve what was learned is still needed. The organizational culture in place must ensure that a knowledge-centric approach is used and that a cooperative environment encouraged for all employees. This sharing mentality may assist

with knowledge sharing even though an employee knows that their employment has ended.

CONCLUSION

This chapter demonstrated that organizational culture is an essential piece to life of an organization. It needs adjustment and alignment in order to produce avenues towards knowledge sharing. Knowledge sharing will bring about a specific and superior competitive advantage once it is based on the correct culture; one based on honest and trust. CEOs like Bob Buckman of Bulab Holdings, Inc. and Bill Gates of Microsoft knew this before they began their journey towards developing a knowledge sharing organization. Buckman, Gates, and many others have seen an enormous return on their investment to make their organizations more aligned with what the customer wants and expects.

Culture will evolve through rounds of learning inside and outside of the culture. Managers must take notice and direct the culture so that knowledge management can succeed. Social media that spawns the correct culture should be implemented and used to build knowledge management correctly. Value benefits must be sought as they direct structure and strategies towards a successful knowledge management matrix.

We must remember as managers there is not one culture best suited for an organization set on building knowledge management capabilities. What has been seen inside studies are certain characteristics that can better enable an organization to achieve steps towards knowledge sharing. Firms employing champions of honesty and trust are better suited to share knowledge with departments inside their organization. Learning throughout all levels of the organization must be leveraged towards a knowledge sharing enterprise. The learning must be measured and actions used through social media to adjust the culture.

REFERENCES

- Alavi, M., Kayworth, T. R., & Leidner, D. E. (2006). An empirical examination of influence on organizational culture on knowledge management practices. *Journal of Management Information Systems*, 22(3), 191–224. doi:10.2753/MIS0742-1222220307
- Argyris, C. (1991/1998). Teaching smart people how to learn. In Harvard Business School Press (Eds.), *Harvard Business Review on Knowledge Management* (pp. 81-108)
- Argyris, C., & Schon, D. A. (1996). *Organizational learning II; Theory, method, and practice*. Addison-Wesley Publishing Co.
- Barkai, I., & Samuel, Y. (2005). The use of organizational learning mechanisms: Environmental, managerial, and cultural correlates. *Academy of Management*, Best Conference Paper, 2005
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120. doi:10.1177/014920639101700108
- Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture*. San Francisco, CA: John Wiley and Sons, Inc.
- Chinowsky, P., & Carillo, P. (2007). Knowledge management to learning organization connection. *Journal of Management Engineering*, 23(3), 122–130. doi:10.1061/(ASCE)0742-597X(2007)23:3(122)
- Davenport, T. H., De Long, D. W., & Beers, M. C. (1998). *Successful knowledge management projects*, Winter 1998, 43-57
- De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *The Academy of Management Executive*, 14(4), 113–127.

- Deal, T. E., & Kennedy, A. A. (1982). *Corporate Cultures: The Rites and Rituals of Corporate Life*. New York: Perseus Books Publishing, LLC.
- Galbraith, J., Downey, D., & Kates, A. (2002). How networks undergird the lateral capability of an organization-Where the work gets done. *Journal of Organizational Excellence*, *Spring 2002*, 67-78
- Gates, B. (1999). *Business @ the speed of thought*. New York: Warner Books, Inc.
- Girard, J. (2004). *Towards an understanding of enterprise dementia: An empirical examination of information anxiety among public service middle managers* (Doctoral Dissertation). Retrieved from Ebsco host (3134168)
- Goffee, R., & Jones, G. (1998). *The character of a corporation*. New York: HarperCollins Publishers, Inc.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of Management Information Systems*, *18*(1), 185–214.
- Hatch, M. (1993). The dynamics of organizational culture. *Academy of Management Review*, *18*(4), 657–693. doi:10.2307/258594
- Heifetz, R..A., Kania, J.V. & Kramer, M.R.(2004). Leading Boldly. *Stanford Social Innovation Review*, *Winter* (2), 3
- Janz, B. D., & Prasarnphanich, P. (2003). Understanding the antecedents of effective knowledge management: The importance of a knowledge-centered culture. *Decision Sciences*, *34*(2), 351–384. doi:10.1111/1540-5915.02328
- Jarvenpaa, S. L., & Staples, D. S. (2001). Exploring perceptions of organizational ownership of information and expertise. *Journal of Management Information Systems*, *18*(1), 151–183.
- Miles, R. E., & Snow, C. C. (1992). Causes of failure in network organizations. *California Management Review*, *34*, 53–72.
- Nonaka, I. (1991/1998). The knowledge creating company. In Harvard Business School Press (Eds.), *Harvard Business Review on Knowledge Management* (pp. 21-36)
- O’Dell, C., & Grayson, C. J. Jr. (1998). *If only we know what we know*. New York: The Free Press.
- Oliver, C. (1997). Sustainable Competitive Advantage: Combining Institutional and Resource Based Views. *Strategic Management Journal*, *18*(9), 697–713. doi:10.1002/(SICI)1097-0266(199710)18:9<697::AID-SMJ909>3.0.CO;2-C
- Pettigrew, A. M. (1979). On studying organizational cultures. *Administrative Science Quarterly*, *24*, 570–581. doi:10.2307/2392363
- Ravasi, D., & Schultz, M. (2006). Responding to organizational identity threats: Exploring the role of organizational culture. *Academy of Management Journal*, *49*(3), 433–458.
- Reed, R., Lemak, D. J., & Montgomery, J. C. (1996). Beyond Process: TQM Content and Firm Performance. *Academy of Management Review*, *21*(1), 173–202. doi:10.2307/258633
- Rousseau, D. M. (1997). Organizational behavior in the new organizational era. *Annual Review of Psychology*, *48*, 515–546. doi:10.1146/annurev.psych.48.1.515
- Ruggles, R. (1998). The state of the notion: Knowledge management in practice. *California Management Review*, *40*(3), 80–89.
- Schein, E. H. (1984). Coming to a new awareness of organizational culture. *Sloan Management Review*, *25*, 3–16.
- Schein, E.H. (1986, January). What you need to know about organizational culture. *Training and Development Journal*.
- Serpa, R. (1985). Creating a candid corporate culture. *Journal of Business Ethics*, *4*(5), 425–430. doi:10.1007/BF02388598

Organizational Culture

Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17, 45–62.

Stoyko, P. (2009). Organizational culture and the management of organizational memory. In Girard, J. (Ed.), *Building organizational memories: Will you know what you know?* (pp. 1–17). Hershey, PA: Information Science Publishing.

Whyte, G. (1989). Groupthink reconsidered. *Academy of Management Review*, 14(1), 40–56. doi:10.2307/258190

Yu, T., & Cannella, A. A. (2007). Rivalry between Multinational Enterprises: An Event History Approach. *Academy of Management Journal*, 50(3), 665–686.

ADDITIONAL READING

Alderfer, C. P., & Smith, K. K. (1982). Studying intergroup relations embedded in organizations. *Administrative Science Quarterly*, 27(1), 35–65. doi:10.2307/2392545

Allee, V. (2003). *The future of knowledge: Increasing prosperity through value networks*. Boston: Butterworth-Heinemann.

Argyris, C., & Schon, D. A. (1996). *Organizational learning II: Theory, method, and practice*. Addison-Wesley Publishing Co.

Arora, R. (2002). Implementing knowledge management—A balanced scorecard approach. *Journal of Knowledge Management*, 6(2), 240–249. doi:10.1108/13673270210434340

Ashforth, B., & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review*, 14(1), 20–39. doi:10.2307/258189

Becerra-Fernandez, I., & Sabherwal, R. (2001). Organizational knowledge management: A contingency perspective. *Journal of Management Information Systems*, 18(1), 23–55.

Beer, M., & Spector, B. (1993). Organizational diagnosis: Its role in organizational learning. *Journal of Counseling and Development*, 71, 642–650.

Best, J. (2006). *Flavor of the month; why smart people fall for fads*. Los Angeles, California: University of California Press.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128–152. doi:10.2307/2393553

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.

Fulmer, W. E. (1999). *Buckman laboratories (A)*. Harvard Business School Case Study N9-899-175. Boston: Harvard Business School Press.

Ghosal, S. (2005). Bad management theories are destroying good management practices. *Academy of Management Learning*, 4(1), 75–81.

Griffin, E. (2009). *Groupthink of Irving Janis. A first look at communication theory* (pp. 235–246). McGraw Hill.

Grover, V., & Davenport, T. (2001). General perspectives on knowledge management: Fostering a research agenda. *Journal of Management Information Systems*, 18(1), 5–21.

Herbold, R. J. (2005). *The fiefdom syndrome*. Doubleday.

Holsapple, C. W., & Joshi, K. D. (2000). An investigation of factors that influence the management of knowledge in organizations. *The Journal of Strategic Information Systems*, 9, 235–261. doi:10.1016/S0963-8687(00)00046-9

Horwitch, M., & Armacost, R. (2002). Helping knowledge management be all it can be. *The Journal of Business Strategy*, 23(30), 26–31. doi:10.1108/eb040247

McElroy, M. W. (2003). *The new knowledge management: Complexity, learning and sustainable innovation*. Burlington, MA: Elsevier Science.

McInerney, C. (2002). Knowledge management and the dynamic nature of knowledge. *Journal of the American Society for Information Science and Technology*, 53(12), 1009–1018. doi:10.1002/asi.10109

Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company: How Japanese companies create dynamics of innovation*. New York: Oxford University Press.

O'Dell, C., & Grayson, C. R. (1998). *If only we knew what we know: The transfer of internal knowledge and best practice*. New York: The Free Press.

Pan, S. L., & Scarbrough, H. (1999). Knowledge management in practice: An exploratory case study. *Technology Analysis and Strategic Management*, 11(3), 359–374. doi:10.1080/095373299107401

Schein, E. H. (1992). *Organizational Culture and Leadership*. San Francisco: Jossey-Bass.

Schendel, D. (1994). Introduction to “Competitive organizational behavior: Toward an organizationally-based theory of competitive advantage.”. *Strategic Management Journal*, 15, 1–4. doi:10.1002/smj.4250150901

Senge, P. M. (2006). *The fifth discipline; The art and practice of the learning organization*. Doubleday.

Sveiby, K. E. (1997). *The new organizational wealth: Managing and measuring knowledge assets*. San Francisco, CA: Berrett-Koehler.

Sveiby, K.-E., & Simonds, R. (2002). Collaborative climate and effectiveness of knowledge work – An empirical study. *Journal of Knowledge Management*, 6(5), 420–433. doi:10.1108/13673270210450388

KEY TERMS AND DEFINITIONS

Absorptive Capacity: The ability of the firm to develop new knowledge based on the firms’ original level of knowledge, the level of knowledge a firm can absorb.

Artifact: A symbol or object that describes an important aspect of an organizations culture.

Autonomy: The freedom an individual or small group believes they possess to follow self-direction, the level of empowerment felt by an employee.

Communities of Practice: The ability of one group to share a level of learning that builds stronger cultural bonds.

Double-Loop Learning: Feedback loops that are used in conjunction with inquiry that leads the individual to change theories-in-use based on observed effects of actions previously used to resolve organizational issues.

Espoused Theory: The values we say we are governed by.

Factions: Groups of individuals that share the same or similar values and norms with respect to aspects of organizational doings.

Institutional Claims: That is, explicitly stated views of what an organization is and represents.

Organizational Learning: The process to where individuals inside the organization learn to address issues based on the culture of the organization, where the employee experiences an issue and inquires on resolutions bounded by the resources offered.

Sagas: A system of collective understanding of unique accomplishment in a formally established group.

Single-Loop Learning: Learning that is only concerned with changing the symptoms of the problem, never looking deeper to the root cause.

Theory-in-Use: The actual values used and displayed inside the organization.

Chapter 8

Social Leadership: Exploring Social Media and the Military – A New Leadership Tool

Scott Campbell Mackintosh
Glengarry Group Consulting, Canada

ABSTRACT

This chapter will identify the military's approach to social media and outline the security controversy it views as an inherent issue associated with condoning and promoting the use of social media. It will then discuss how that approach is evolving with the passage of time and the rapid adoption of social media by society as a whole; examining the balance between security concerns and obvious organizational benefits. In discussing social media as a vehicle of transformational leadership this chapter will reveal untapped benefits of social media in a military context and examine where and how it could be adopted. In closing this chapter will make recommendations, which would facilitate a better adoption of various forms of social media by the military.

INTRODUCTION

Unlike its corporate counterparts the military has unique challenges associated with benefiting from the adoption and use of social media. While corporations want to protect information related to competitive advantage, unique processes and other sensitive data that might aid their competitors - the military has a much graver concern as it relates to the release of sensitive data. On the other hand as the use of various social media

platforms and sites become more prevalent in the ranks of the military, and controlling the restriction of the use of those sites becomes more difficult, an understanding is developing that if used properly – social media can be an effective tool for creating military advantage; specifically in the areas of recruiting and public relations.

Reaching the generation Y or Millennium generation through social media platforms allows the military access to the next generation of recruits. With the advent of Facebook pages and Tweets, to name just two of the many social media avenues,

DOI: 10.4018/978-1-60960-203-1.ch008

the military has a vehicle to create a new face from a public relations perspective.

Despite strong benefits the military still struggles in trying to balance the potential gain of this new media with the possible damage it could do operational security (OPSEC). It is important to note however that both of these consideration focus on an external perspective; how social media impacts what comes out of the military whether that be a recruitment drive, an advertising or marketing push designed to change public opinion, or in the worst case the release of sensitive data. Little if any of the coverage or thought leadership around social media and the military is giving any consideration to how social media might be used internally as a leadership tool.

With all of the promise that this concept brings it does not come without its challenges. The military cannot easily take full advantage of social media, as do corporations, without some special considerations. Social media has built a new platform for what can be defined as social leadership. For a corporation to foster an environment where leadership and the next great idea rise from the shop floor or out of a bag in the mail room clearly creates a competitive advantage. Social knowledge supports the concept that good ideas can rise from the bottom as easily as they can slip from the middle or descend from the top. A corporation willing to restructure traditional top down leadership opens itself to a world of possibilities and creates an environment where people feel a sense of ownership and contribution. By creating such an environment what is, in effect, happening is the democratization of social knowledge. When you apply the same strain of thought to the Military it is fair to say that the military and democracy share allegiance only in as much as one defends the other. The military, while it defends democracy, need not incorporate any of its principles in providing that defense; in fact at its core it is an “I say – you do” institution that does not look to leadership from the bottom. With the rapid adoption of social media there

now exists the opportunity for junior leaders, at any rank, to provide social leadership that has the potential of swaying opinion both inside and outside of the military circle. The challenge is how to harness and capitalize on that leadership without unraveling the very fabric of the institution. The Military is going to have to accept, to some degree, the democratization of social knowledge in order to benefit from all it can bring as a new tool in its leadership arsenal.

BACKGROUND

If Social Knowledge is the use of social media to create, transfer, and preserve organizational knowledge – past, present, and future – with a view to achieving the organizational vision; it can be argued that the military is undergoing a transformation with respect to its approach to this new battlefield and what vision it wants to create.

In the early days of social media the military treated it, as it does with all unknowns, solely as a threat. There were, and to a large degree still exist, serious concerns around social media sites and operational security (OPSEC). Fears were rampant that social media had the potential to put sensitive information into the wrong hands.

In February of 2008 the Canadian Broadcast Corporation (CBC) reported on the Canadian Forces attempts to ban use, by members, of social media sites such as Facebook citing concerns around OPSEC. They reported on a memo issued by DND to warn members of the dangers:

Al Qaeda operatives are monitoring Facebook and other social networking sites...

This may seem overdramatic ... [but] the information can be used to target members for further exploitation. It also opens the door for your families and friends to become potential targets as well (CBC News, 2008).

Social Leadership

As the Canadian Forces continued to investigate and better understand the role of social media within their ranks their posture eased. While there are still concerns relevant to OPSEC and sites like Twitter that ask the troublesome question “what are you doing now?” the Canadian Forces have begun to understand that the threat level is not quite what initial assessments led them to believe. The warnings eased to become reminders in places like Regimental Routine Orders. In the case of the Queen’s Own Rifles of Canada (A Reserve Regiment stationed in Toronto), the Commanding Officer, used Routine orders published for October of 2009 to caution soldiers on the use of Facebook, and indicated that it was a violation of military law to release data that identified members of the Regiment that were currently overseas or on work up training as a part of pre-deployment. It was a clear warning but did not ban soldiers from participating in social media. The Commanding Officer was taking a position that was reflective of the Canadian Forces global approach to social media in that it has released a General Order that acts as an advisory to its members on the sensitivity of certain types of information that could be released through some of the social networking sites.

The public affairs branch of the Canadian Forces gave an on-line interview to CFAX on the 15th of August 2009 where the official summed up the current position with respect to OPSEC and social media by stating: *We trust them to make life or death decisions, we can trust them to tweet.*

In August of 2009, the United States Marine Corp took a much stronger stance when it banned the use of all forms of social media as reported by the Huffington Press:

The Marine Corps on Monday issued an administrative directive saying it was banning the use of Marine network for accessing such sites as Facebook, Twitter and MySpace. The order doesn't affect Marines' private use of such networks on personal computers outside of their jobs... the

service's computer network already effectively blocks users from reaching social networks, officials said. Marine officials said part of the reason for the new ban was to set up a special waiver system that governs access for Marines who need to reach the sites as part of their duties (Jelinek, 2009).

The marine Corp’s stance on social media mirrors that of many other branches of the US Armed Services. Ann Peru Knab, an Associate Professor with the University of Wisconsin and a Public Affairs officer in the Air Force Reserve asks the question, “Isn’t it ironic ... the most technologically-advanced air force in the world doesn’t allow its public affairs officers to “tweet” or recruit on official Air Force networks?” It is questions like that that has the Department of Defense (DOD) reviewing its current policy on social media with an eye to release a more balanced policy. Heather Forsgren Weaver of the American Forces Press Service reports that:

Defense Department officials plan to forward a social media policy to the department leadership ... that will balance the pros and cons of social networking sites “I think there are two issues that need to be balanced,” said Price Floyd, principal deputy assistant secretary of defense for public affairs. “No. 1, you need to recognize the benefits taking part in social networking sites and social networking media give you, as well as the risks involved.

Noah Shactman, editor of Wired magazine’s National Security Blog ‘Danger Room, noted there are dozens of overlapping policies about what various branches of the military are allowed to do. The Marines, for example, recently banned Twitter and Facebook from its official networks, while the Army ordered that its networks be allowed access to the sites(Weaver, 2009).

While the military is beginning to realize that with a potential employment base of young soldiers, sailors, marines, and airmen, who have been raised in the digital generation, there is no

effective way to stem the tide of social media it still struggles with completely embracing it. Concerns around OPSEC, while arguably best handled through continuing education and leadership, are still present in mind. Ultimately it is the responsibility of the individual members to understand OPSEC concerns and not to publish material that could jeopardize themselves, their unit or mission integrity, but clearly the military still struggles with balancing these two aspects of their policy.

Even amidst all of the OPSEC concerns the DOD and the military clearly recognize the benefits associated with using social media platforms for recruitment, bolstering public relations, and as a vehicle for delivering service and support to members and their families.

When it comes to recruitment, the US Army is, according to Suzanne Nagel, the Army Accessions Command's media and Web chief, "fishing where the fish are" (Miles, 2009). The Army is creating a presence in a growing array of social networks in order to reach out and tap into an important demographic; 18 -24 year olds who might be considering a career in the Army. "For us, the fish are the prospects -- the person who might be interested in joining the Army" says Nagel (Miles, 2009). While the Marine Corp is backing off social networks and struggling to determine the risk reward equation the Army is surging ahead. Having established a corporate sponsor page on MySpace which now has over 90,000 friends the Army reaches young people who might not otherwise find their way to www.goarmy.com. They recognize that young people spend a lot of their time on-line and a large portion of that time interacting with a variety of social networks.

As an extended arm of its recruiting efforts the Army reaches out to potential recruits through an innovative blog www.armystrongstories.com; a trail blazing initiative for the military and its use of social media. This site encourages soldiers of every rank to join as a blogger, tell their story, and answer candid questions of the people thinking

of following in their footsteps. While the Army monitors the traffic to ensure OPSEC and to make sure that responses and commentary are neither politically sensitive nor offensive in any way, they leave their soldiers free to openly chat about Army life with potential recruits. The site also offers the reader the ability to share the post they have just read through a simple click to Yahoo! Buzz, Facebook, MySpace, Digg, Del.icio.us, Newsvine, StumbleUpon, and Twitter with their own social network. A side bar provides direct links to the four Army home pages, the three Army Facebook initiatives and the new Army MySpace page.

Putting a human face on the military is the type of institutional leadership that social media can deliver. It allows the Military to use social media as a tool to lead society to where they want them to be thus gaining support for recruitment and bolstering public opinion, and knowledge of the military. The Army has had success with their new social media initiatives well beyond their initial expectations which were that of having an Army fan pages. A quick tour of the Army discussion board shows that well over 2,500,000 people have viewed the response to the general question category about joining the Army. This is a recruitment tool like no other as it is a passive way of getting up to the minute information. In the past potential recruits would have needed to actively call or visit a recruiting centre to get the type of information that is currently available on-line through this Army led social network.

The Army's social network initiatives are expanding in scope for fiscal 2010 to better reach future soldiers, but their current efforts are bridging a gap between recruitment and public relations. Influencing public opinion or the perspective the public has of the military is clearly one of the benefits of social media.

When examining how one sways public opinion Psychological Operations (PSYOPS) has traditionally been the driver behind the concept of "the winning of hearts and minds", but has often been thought of as an element to be deployed

Social Leadership

only within a theater of war or conflict to deny the enemy the support of the local population. Through the institutional leadership potential of social media PSYOPS can start to win the hearts and minds of citizens in a way that has yet been thought of. While this may be less important in the United States, in countries like Canada where military spending represents a disproportionately small segment of the GDP it can have a critical impact.

According to the founder of Centre of Excellence for Public Sector Marketing:

One can argue that opening up the channels of communication between the military and the Canadian public would actually improve the safety of our troops, since Canadians would understand the true nature of the role we are serving in Afghanistan (which would quite possibly help the troops attain more support, more equipment, improved morale and heightened faith in their military leaders) (Kujawski, 2008).

For the Canadian Military social media could become a powerful tool in getting Canadians to rethink the way in which they support the military. An increase in the popular support base for the military changes the political landscape in a significant and meaningful way. Examples of this we have already seen in the political response of the Ontario provincial government to the requests of hundreds of thousands of Facebook users to have the section of the 401 Highway, running from Trenton to Toronto, designated as “The Highway of Heroes” to honor the Canadian Soldiers who have fallen in Afghanistan. The social response was so strong it simply could not be ignored. This just one of over 1100 Facebook groups with the words “Canadian Forces” in the group title. Social media has provided a very real conduit for connecting soldiers and the public.

While the US Armed Services may not need to rally public support to the same degree it too is finding new ways to drive advantage through the

use of social media by recognizing social media as a tool in the arsenal of service and support. Many social networks are beginning to pop up in cyberspace where the *raison d’être* is purely to support the member or the member’s family. While many of these are not military led initiatives, service personnel certainly glean tremendous value from them and are becoming active participants in them.

From a civilian perspective, it may be hard to understand the challenge of constant relocation that comes with military service. Finding new schools, identifying new organizations to join and tracking down a safe neighborhood can be an overwhelming process. As a result, many military families turn to others in the military community for information and resources (Findlater, 2009).

This led to retired Army Colonel Dan Kissinger, founder of www.militaryavenue.com, to comment:

The interactive nature of the site is geared to assist younger military families who have grown up with the Internet and rely on community forums like this regularly for information exchange, Dan Kissinger said. “With this flexible and easily updated platform, MilitaryAvenue.com is providing a much-needed resource for younger military members accustomed to seeking information from social media communities

Looking forward, he said he is hopeful that this tool will set a precedent in how military members access and share information with one another (Findlater, 2009).

MAIN FOCUS OF THE CHAPTER

As the debate and deliberations around risk versus reward of social media adoption continue the military establishment seems to miss the central potential benefit of social media from an internal perspective and that is allowing the development

of a truly transformational leadership environment. The interesting development relating to the support networks that are popping up in and around our military communities is that they are not being driven and or supported by the military establishment. Rather it is individual leaders such as Dan Kissinger who are behind their development and growth. Individual leadership or what can be identified as social leadership by its very nature is transformational.

Developed initially for political leaders in the 1970's by James MacGregor Burns transformational leadership is defined as follows:

Leadership over human beings is exercised when persons with certain motives and purposes mobilize, in competition or conflict with others, institutional, political, psychological, and other resources so as to arouse, engage, and satisfy the motives of followers... in order to realize goals mutually held by both leaders and followers....

Transformational leadership occurs when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality (Burns, 1978).

It can be argued that this is exactly what Kissinger is doing with militaryavenues.com. While there are many definitions of transformational leadership, all of which vary to a degree, the primary element associated with this style of leadership is the existence of a visionary leader who inspires others to follow, and seeks to implement positive change. The transformational leader has passion for and an absolute belief in the vision.

The challenge for a transformational leader is leading the change, staying visible, constantly providing motivation and communicating with their followers. This is where social media provides a new and exciting platform for the leader. The followers have expressed an active interest in becoming a part of the new vision and remain engaged as long as the leader provides direction

and motivation and an ongoing commitment to change. An intelligent leader uses this new media as a tool to unearth those potential followers in ways they could not do otherwise.

In the military command and control is omnipresent in the minds of potential followers. Members are given a specific path to follow and this begins in basic training. You will wear your uniform in a specified manner, you will act according to a specified code, there will be unilateral cooperation toward a common goal, and you will execute your responsibilities as directed. Nowhere in the corporate world do we see such a rigid framework of execution or such tight controls to ensure employees do not deviate. As a result the military's interest and adoption of transformational leadership goes as far as to promote vision and inspiration but reserves the capability of implementing positive change on a systemic level for those of senior rank.

For a junior officer to attempt to use social media as a systemic transformational tool would quite likely place that officer in a position of receiving a reprimand, and or a cease and desist order regardless of the merits of the vision.

The Canadian Forces has, for a number of years, been investigating the potential incorporation, of the principles of transformational leadership into its doctrine:

Existing CF doctrine does not include any reference to transformational leadership. This is not surprising, seeing that it was published in 1973, before the emergence of the transformational leadership theory. CF leadership doctrine has been under review in recent years and a new manual is expected next year...transformational leadership concepts will be included, along with important elements of other leadership perspectives Bradley & Charbonneau, 2004, p.12).

That begs the question of; "To what degree will the military commit themselves to transformational leadership?". True transformational

Social Leadership

leadership is closely related to the growth of Tribes as defined by Seth Godin, an advocate of leadership through the application of social media. “A Tribe is a group of people connected to one another, connected to a leader, and connected to an idea. A group needs only two things to be a tribe: a shared interest and a way to communicate” (Godin, 2008, p.1).

So if the emerging of these Tribes is not a predetermined effort of the institution to “win hearts and minds”, nor is it a segment of their service and support leadership, what then is it? It is the democratization of social knowledge. It is the birth of social leadership. It is creating an environment where individuals can lead their Tribes. The benefits of transformational leadership in a corporation may be evident, but what are the benefits to the military in a tight command and control culture? The answer to that lies in the military making a culture shift to some degree.

The move to social media has been somewhat unsettling at the Pentagon, with its tradition of top-down authority, said Lcol Arata. In cyberspace, where anyone can post feedback anonymously, the musings of military supporters can appear alongside those of anti-war critics. “This is a culture shift for us,” Arata said. “When people exchange thoughts, it’s not always rosy. That’s something we as a culture have to get over (Staton, 2009).

Godin argues that through the many social media technologies and opportunities available there truly are no barriers to entry to lead a tribe. This has to be a salient concern with respect to social media for an organization whose grassroots are founded in command and control. He goes on to say that, “Some tribes are stuck. They embrace the status quo and drown out any tribe member who dares to question authority and the accepted order. Big charities, tiny clubs, struggling corporations – they’re tribes and they’re stuck” (Godin, 2008, p.5).

He makes the case that these tribes are just movements waiting to happen but not so with the military based upon their strong culture of command and control; movements don’t just happen. “

The highly leveraged tools of the Net make it easier than ever to create a movement, to make things happen, to get things done. All that is missing is leadership” (Godin, 2008, p.5).

The primary argument the Godin advances is that the rise of a multitude of new technologies in the world of social media make leadership an increasingly easy avenue to pursue. Social media technologies have created an electronic soap box, placed on the digital corner. It allows leaders an avenue to pursue whose reach before would have been the exclusive domain of traditional media, be it print or broadcast. When you look back at the methods leaders traditionally had to take their ideas forward they were reserved to standing on a soap box, grabbing the interest of print media, or if ever so lucky broadcasting their message through the networks; something typically reserved for our political leaders or those with extremely deep pockets.

“Every one of these tribes is yearning for leadership and connection. This is an opportunity for you – an opportunity to find or assemble a tribe and lead it...” (Godin, 2008, p.8). If Godin recognizes this opportunity it is not too far of a stretch to believe that others who are charged with examining the potential of social media have understood this as potential of the technology.

It is even easier with social media to grab the reigns of leadership as you can obscure yourself in anonymity and don’t need the skills associated with the great orators of our time. Rallying people to the cause, through a tremendous presence and public speaking ability, is no longer a must have. Rather all that is necessary is a clear purpose, a sharp mind and wit, good content and a thought provoking message. Mix in some skills with the written word and you have a tribe.

Creating a tribe is not always that easy. As Godin explains, “We live in a world where we

have leverage to make things happen, the desire to do work we believe in, and a marketplace that is begging us to be remarkable. And yet in the middle of these changes we still get stuck” (Godin, 2008, p.10).

Stuck is clearly where the military is today with respect to its use of social media as an internal tool for leading change; for transforming leadership. This speaks to the very heart of what the military struggles with. If they wish to become a tribe then they need to push, internally, a top down adoption of some form of social media or they stand to lose tremendous opportunity for meaningful change. The real question is do they have any interest in doing so?

The military has a couple of challenges, in terms of refreshing the ideas at the top of the leadership pile, which do not restrict their corporate counterparts. The first issue is that succession planning comes entirely from within and arguably for good reason. The military does not look to the outside world for their next Chief of Defense Staff; therefore the pool from which to select your top leader is restricted to a few candidates. Resultantly change and innovation is only going to germinate from that pool of individuals. Unlike a corporation that can hire a CEO with new and innovative ideas, to some degree military leaders are very much cast from the same mold. This gets us back to the concept of basic training and the growth of uniformity. The other issue is that the military adopts a rigid command and control structure that does not promote or support the concept that ideas that can have a meaningful impact could float to the top from the bottom of the pile. Ambitious junior leaders who attempt to improve or modify the status quo are quickly lectured on not working beyond their pay grade. So the question then becomes how social media can impact that?

To define the capabilities of social media within an organization Godin outlines that social media has made it exceedingly easier to become a leader. He argues that:

For the first time ever, everyone in an organization - not just the boss - is expected to lead...The very structure of today's workplace means that it's easier to change things and that individuals have more leverage than ever before...The marketplace is rewarding organizations and individuals who change things and create remarkable products and services...It's engaging thrilling profitable and fun.. Most of all, there is a tribe of fellow employees or customers or investors or believers or hobbyists or readers just waiting for you to connect them to one another and lead them where they want to go (Godin, 2008, p.12).

Corporations that are capable of making effective use of social media will benefit from the knowledge and change in process that evolves through these initiatives, however in its current command and control environment the military does not do collaboration well. There is evidence, as we have seen with the Canadian Forces interest in transformational leadership, of the overall interest in making collaboration work in the right environment, but clearly not in environments where lives are in the balance.

Godin argues that most of us shy away from the leadership challenge because we have neither been ordained to lead nor do we possess the authority to lead. He motivates his readers to cast aside these traditional notions and step up to the proverbial plate. But it is this very advice that the military fears will take root with an application of social media.

Thomas Barnett changed the Pentagon. From the bottom. No, he wasn't on KP duty, but he was close. He had no status, no rank – he was just a researcher with a big idea. Here is what the Wall Street Journal had to say:

Mr. Barnett overhauled the concept to address more directly the post 9/11 world. The result is a three hour PowerPoint presentation that more resembles performance art than a Pentagon brief-

Social Leadership

ing. It's making Mr. Barnett, 41 years old, a key figure in the debate currently raging about what the modern military should look like.

It's simple really. Barnett led a tribe that was passionate about change. He galvanized them, inspired them, and connected them, through his idea (Godin, 2008, p.20).

Barnett clearly provided his tribe with transformational leadership. He provided a vision and had the passion to lead people toward a better end. One would have thought that to be almost an impossible task in an organization as monolithic as the Pentagon, but it was accomplished.

Social media clearly has some concerns around it as it relates to OPSEC and also offers tremendous tools for the military to reach out to a waiting audience, but these are the extrinsic elements of social media. The intrinsic promise of social media is the ability to move forward a culture of transformation leadership. This is not to say that transformational leadership would in any way replace command and control; rather it would augment it.

SOLUTIONS AND RECOMMENDATIONS

While the DOD busies itself with the preparation of a new and balanced policy on the uses of social media in the military it needs to recognize that this policy will only cover half of the social media paradigm; that which is outward facing. It ought to, as should all militaries, look to a policy that takes into account the leveraging of these very same technologies for the betterment of the inward facing components of the organization.

A simple example of how to manage the logistics of such an idea would be to take the concepts and technology that fuel armystrongstories.com and develop an intranet that allowed soldiers of

all ranks to join the net, subscribe to subgroups, and begin to offer forth their experience and knowledge. The Army would need to moderate this in much the same fashion that they do with their internet sites. Instead of being concerned about external OPSEC violations and potentially damaging topics or language they would be ensuring that an initiative of this nature didn't evolve into a gripe board. Nor would this would not be the place to discuss operation topics as not all members of the military have the same security clearances or work in the same trades. The Army has made inroads into this arena with internal sites such as Platoon Leader, which leverage iLink, a social network analytics technology. The purpose of this site is operational in nature and is not systemic in that it allows a small subgroup of professionals to communicate. While this is an excellent example of social media at work inside the modern military it is not institution wide, nor is it transformational. It simply allows peers to exchange experience and information.

The military needs a true social media project that, while not casting aside the role of command and control, relaxes the constraints in such a manner that members of all ranks can participate and bring forward ideas, solutions and experience. The rules governing insubordination and OPSEC would still apply but gone is the concept of working within your pay grade. Yes a Specialist just home from Afghanistan might just have a solution that solves the Majors problem. In today's military there exists no channel through which that Specialist can pass on innovation. If you believe that channel is an effective use of the chain of command well you perhaps need to visit one of the Army's recruiting sites because you have not served. Creating this open highway for innovation and ideas, while not disturbing the operational theater or the much needed command and control mechanism of the military is one of the pure benefits of, and great promise of social media that the military has yet to capitalize on.

REFERENCES

- Alaimo, C.A. (2009, May 17). Facebook, Social Media Infiltrating US Military. *Arizona Daily Star*.
- Bradley, P., & Charbonneau, D. (2004). Transformational Leadership: Something New, Something Old. *Canadian Military Journal*, 5(1), 7–14.
- Burns, J. M. (1978). *Leadership* (1st ed.). New York: Harper & Row.
- CBC News. (2008). Military warns soldiers not to post info on Facebook. Retrieved April 1, 2010 from <http://www.cbc.ca/canada/story/2008/02/25/facebook-military.html?ref=rss>
- Findlater, J. (2008). New Social Media Platform Helps Military Members With Relocation. American Forces Press Service. Retrieved April 1, 2010 from <http://www.defense.gov/news/newsarticle.aspx?id=52160>
- Godin, S. (2008). *Tribes: we need you to lead us*. New York: Portfolio.
- Jelinek, P. (2009). Marine Corps Bans Twitter, Facebook, Other Social Media Sites. *Huffington Post*. Retrieved April 1, 2010 from http://www.huffingtonpost.com/2009/08/04/marine-corps-bans-twitter_n_250939.html
- Kujawski, M. (2008). Military warns soldiers not to post info on Facebook. Retrieved April 1, 2010 from <http://www.mikekujawski.ca/category/statistics/page/3/>
- Miles, D. (2009). Army Leverages Social Media to Promote Recruiting. American Forces Press Service. Retrieved April 1, 2010 from <http://www.defense.gov/news/newsarticle.aspx?id=55273>
- Online, C. F. A. X. (2009). Canadian Forces and Social Media Make Interesting Bedfellows. Retrieved April 1, 2010 from <http://www.cfaxonline.com/?p=929>
- Stanton, J. (2009). The New Media and the US Military. Retrieved April 1, 2010 from http://www.digitalcommunitiesblogs.com/web_20_convergence/2009/05/the-new-media-and-the-us-milit.php
- Weaver, H. F. (2009). Defense Department Officials to Announce Balanced Social Media Policy, American Forces Press Service. Retrieved April 1, 2010 from <http://www.af.mil/news/story.asp?storyID=123169299>

Chapter 9

Foundations of Cross–Cultural Knowledge Management

Nhu T. B Nguyen

Japan Advanced Institute of Science and Technology, Japan

Katsuhiko Umemoto

Japan Advanced Institute of Science and Technology, Japan

ABSTRACT

Although the term “Cross-Cultural Knowledge Management” (CCKM) appeared in the recent literature, no study has defined CCKM yet. This is the first study that discusses the process of cross-cultural knowledge creation. Reviewing the literature on the relationship between cross-cultural management (CCM) and knowledge management (KM), we found that the term CCKM is emerged from two streams. The first stream used CCKM to describe KM in a cross-cultural environment while the second stream explored culture as knowledge. Following two streams, we then define CCKM as a series of practices to recognize and understand cultural differences to develop a new culture thereby adjusting to cross-cultural environment. This definition helped us to examine the process of cross-cultural knowledge creation and the role of leadership in this process. Not only contributing to developing KM in a new way that can be applied to practice in utilizing and creating cross-cultural knowledge for KM activities, but this chapter also may have many practical implications for leaders to manage effectively cross-cultural knowledge of members in organizations.

INTRODUCTION

Knowledge Management (KM) has been developed since the early 1990s by both researchers and practitioners. It is not surprising to KM researchers that the relationship between Knowledge Management (KM) and Cross-Cultural Manage-

ment (CCM) started to be widely studied, since globalization has become a keen interest in every study on management. As such, we looked into this relationship, and recognized that the term Cross-Cultural Knowledge Management (CCKM) can be understood in two ways. In one sense, CCKM is used to describe knowledge management in a cross-cultural environment, such as how multinational companies manage knowledge processes,

DOI: 10.4018/978-1-60960-203-1.ch009

or how international joint-ventures share, acquire, and transfer knowledge effectively. In another sense, we explored the idea that CCKM may refer to the management of cross-cultural knowledge (Nguyen, Umemoto & Medeni, 2007; Nguyen & Umemoto, 2009). To elaborate this new sense, we explained the perception *culture as knowledge* by discussing several cross-cultural perspectives, including third culture, cultural synergy, cultural hybrid, cultural change, cultural intelligence, cultural competence, cultural diversity, and cultural knowledge, which match the concept of knowledge in the literature (Nguyen et al., 2008).

With the perception *culture as knowledge*, we adopted the term “Cross-Cultural Knowledge Management”, to refer to the management and the creation of a new culture adept at adjusting to cultural differences. The question is raised: What are the stages that characterize the process of cross-cultural knowledge creation? To answer this question, we suggested a theoretical model of CCKM based on Martin’s (2002) cultural perspectives, including fragmentation, integration and differentiation. We used the term “acculturation” to describe the creation of a new culture, which includes values added from two or various cultures, adapted to the cross-cultural environment, as the last stage of the cross-cultural knowledge creation process. We also explained why cross-cultural knowledge creation is a spiral, from which KM can be improved and enhanced. Moreover, we also considered the further question whether leadership has any role in CCKM, since leadership has an important role in both CCM and KM, and CCKM is the combination of CCM and KM. Therefore, we continue to seek answers to this question. Using the literature of leadership, we argued the influence of leadership on each factor of our proposed theoretical model of CCKM (Nguyen & Umemoto, 2009).

Because of this book’s emphasis on social knowledge, this chapter generally seeks to provide a meaningful description of the positive position of cross-cultural knowledge, as a kind of social

knowledge in the current context of globalization, which has become unprecedented. Recently, people often work in international companies, departments, and teams. We believe that this study establishes the major foundation of CCKM, serving as a new discipline which is partially drawn from constructs developed in the disciplines of KM and CCM. It is important to develop this discipline in understandable terms, illustrating the nature of the cross-cultural knowledge creation process and the roles of leadership in this process.

CULTURE AS KNOWLEDGE

As we explained, we base our understanding of Cross-Cultural Knowledge Management on the perception *culture as knowledge*. To explain this perception, we first explore the concept of knowledge. At the same time, we review the characteristics of the relevant concepts of cross-cultural knowledge to propose which one of these characteristics can be used to describe the knowledge concept. Following that, we sketch out our interpretation of *culture as knowledge*.

The Concept of Knowledge

The most important starting point for our discussion of the knowledge concept focuses on the distinctions among concepts of data, information, and knowledge. As one of the pioneers of the stream which considered knowledge management as the transformation of data and information, Drucker (1993) explained knowledge as “information effective in action”. Data is defined as the observations or the facts “out of a context”, however, “not directly meaningful”. Information is understood as “placing data within some meaningful content, often in the form of a message”. Following that, knowledge is recognized as “information put to productive use” (Kakabadse et al., 2003; cited in Geisler, 2008). Nonaka and Takeuchi (1995) also explained knowledge from

information perspective by arguing knowledge as “a flow of messages”. In addition, knowledge is highlighted “essentially related to human action”, as they explained, “knowledge is created by that very flow of information, anchored in the beliefs and commitment of its holder”. Agree with Nonaka and Takeuchi (1995), Choo (2006, p. 133) also said that the transformation of information “when a human actor forms justified, true beliefs about the world”. Also, Davenport and De Long (1998) and Kwan & Cheung (2006; cited in Balmissse, 2008) said that information could not be transformed into knowledge without individual actor who creates knowledge by adding value to information. Therefore, the individual actors play decisive role in distinguishing knowledge from information (Adamides & Karacapilidis, 2006; Frank & Garnodi, 2005; and Davenport & Jarvenpaa, 1996; cited in Balmissse et al., 2008).

Knowledge, in Tsoukas & Vladimirou’s (2005) understanding, includes values and beliefs, and is much related to action. According to Tsoukas and Vladimirou, knowledge is “the individual capability to draw distinctions, within a domain of action, based on an appreciation of context or theory” (p. 128). This understanding is to establish the concept of organizational knowledge. Organizational knowledge, as the capability of organizational members has been developed “to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalizations whose application depends on historically evolved collective understandings”. This concept follows Bell’s definition which emphasizes that knowledge includes values and beliefs, and connects to action. Knowledge, according to Bell, (1999, cited in Tsoukas & Vladimirou, 2005), can be understood as “the capacity to exercise judgment of the significance of events and items, which comes from a particular context and/or theory” (p. 120). This capacity demands the individual ability of drawing distinctions and the location.

Making the distinction between knowledge and information, however, is imprecise, as information is “both umbrella term for all three, and also the connection between raw data and the knowledge eventually attained” (Davenport, 1997, p. 8). Data, in Davenport’s (1997, p. 9) definition, describes “simple observations of states of the world” that are “easily structured, easily captured, often quantified and easily transferred”. Following from that, information relates to “data endowed with relevance and purpose” that “requires unit of analysis, needs consensus on meaning and human mediation necessary.” Although accepting knowledge as valuable information of human mind, including reflection, synthesis, and context, Geisler (2008) claimed that the problem of the taxonomy of data-information-knowledge “fails to offer a robust hierarchy of complexity or a tractable flow from the elemental to the compound” (p. 10). The boundary between information and knowledge, according to Geisler, is not clear, and we don’t know where information ends and knowledge begins. Also, the definition of knowledge as “a variant of useful information”, as Geisler (2008, p. 11) argued, is not a distinct concept inasmuch as “information and useful information are similar definitions of the same notions”. It is unrealistic to understand knowledge as the transformation of information only, Geisler even believed, because this understanding “prevents knowledge from being defined as an independent entity, with its own ontology” (p. 12). To find the boundary between information and knowledge, Liew (2007) suggested that we should know where information resides. Liew indicated two different residences of information: information resides in storage media (from database) and information in the human mind. The boundary between information and knowledge in the first one, according to Liew, is not difficult to see. But in the second one, this boundary becomes obvious. Although several studies on KM indicated that knowledge exists only in human mind, fixing the boundary between knowledge and information is a difficult task (Non-

aka, 1994; Faley and Prusak, 1998; Tuomi, 1999; cited in Hicks et al., 2007), Nissen (2002; cited by Hicks et al., 2007) begins with the opposite idea by showing that knowledge, from the side of the knowledge's creator, is to create information. The critical first step in thinking about the hierarchy between data, information, and knowledge from the creator's side was an appreciation. Specifically in a cross-cultural environment, we think that the creator is also the seeker in the same context. For example, when we enter a different culture than our existing culture, we are both the seeker and creator in the process of creating a new culture from two different cultures.

The relationship between information and knowledge, as Aadne et al., (1999) emphasized, should be seen in a specific situation, context, organization, or individual. In the context of handling and processing information, according to Aadne et al., (1999), knowledge is the result of information processing, among multiple interpretations of information. This interpretation, in fact, was noted by Probst et al. (1998) when they developed the concept of organizational knowledge. Individuals may attempt to interpret their environment by themselves. The individual knowledge structures, which may be accordingly revised, are synthesized to create shared beliefs. The routinization of those shared beliefs is organizational knowledge. Also, in the history of research on the interdependence of information and knowledge, Wiig (2004) emphasized the different purposes of information and knowledge. While the purpose of information is description, because information is composed of data in a specific situation, condition, context, and challenge, or opportunity, the purpose of knowledge is action, because knowledge includes facts, perspectives and concepts, mental reference models, truths and beliefs, judgments and expectations, methodologies, and know-how. Moreover, knowledge is to understand "how to juxtapose and integrate seemingly isolated information items to develop new meanings – to create new insights

with which to approach effective handling of the target situation" (Wiig, 2004, p. 74).

Focusing on knowledge from the information perspective is admirably efficient and works quite well in the existing literature, however, the lack of consideration of knowledge's functions may not clearly show the facts as they are. Thus, to define knowledge, Alvesson (2004) tried to look into its functions, such as embracing information, knowing, explaining and understanding. A similar definition of knowledge proposed by Liew (2007) suggested that knowledge could be used to recognize (know-what), to act (know-how), and to understand (know-why). In general, a good definition, according to Liew (2007), should cover three necessary points including boundaries, purpose, and attributes or characteristics. Understanding the definition of knowledge based on the information perspective covers only the boundaries of this definition. Therefore, it may be worth mentioning its functions in conceptualizing the term knowledge.

With the views of the knowledge concept above, we recognize that the most important aspects of understanding the term *knowledge* are the ability of drawing distinctions and location, developing new meanings, and creating new insights rather than adding value to information. More importantly, we take these views on the significant reasons for our *culture as knowledge* arguments in the next section.

Dimensions of Knowledge

Benefited from Polanyi's conception of tacit knowledge, Nonaka (1994) argued that knowledge should be epistemologically understood as two distinct types: tacit knowledge and explicit knowledge. While explicit knowledge is easy to define, capture, and transfer in different environments, tacit knowledge is difficult to codify and transfer, because tacit knowledge exists within individual minds, and individuals do not recognize tacit knowledge in themselves. Although the

distinction between tacit and explicit knowledge is well justified in the literature, Geisler (2008) recently argued that it is at best an artificial differentiation. According to Geisler, knowledge is the starting point of a flow in which knowledge and information participate, not data and information. Considering sensorial inputs as the basic units of knowledge, Geisler recognized that this understanding is very different from the understanding of knowledge as the transformation of information because sensorial inputs, as Geisler (2008, p. 15) explained, as a cluster of human being's five senses which "are very crude forms of human cognitive manipulation of inputs from its internal and external environment". Sensorial inputs are referred to as tacit knowledge. Consequently, Geisler assumed that all knowledge is tacit. In fact, Tsoukas (2005) already noted the reasoning behind the distinction between tacit and explicit knowledge. According to Tsoukas (2005, p. 122), "the most explicit kind of knowledge is underlain by tacit knowledge." Understanding tacit knowledge as "a set of particulars of which we are subsidiary aware as we focus on something else" (p. 22), Tsoukas argued that tacit knowledge and explicit knowledge are two faces of the same coin, because he was persuaded that all knowledge has its tacit presuppositions. This argument appears particularly well suited for Cook and Brown's (2005, p. 56) understanding of knowledge, while they discussed that the interaction between tacit knowledge and explicit knowledge "can often be used as an aid in acquiring the other." In other words, tacit knowledge can be used as an aid to acquire explicit knowledge, and explicit knowledge also supports individuals in getting tacit knowledge. Our aim here, it should be noted, is not to reject the tacit-explicit distinction. Rather, we try to develop an adequate understanding of the forms of knowledge to place our conception of cross-cultural knowledge in the context of these forms in the following pages.

Other important dimensions of knowledge should be noted. Garut and Nayaare (1994, cited

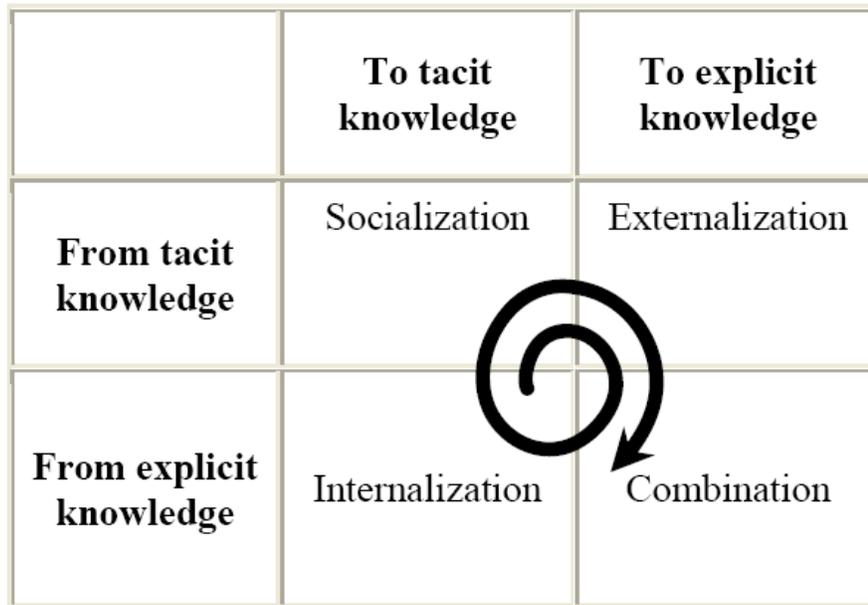
in Bhagat et al., 2008) proposed three dimensions of knowledge, including simple versus complex, explicit versus tacit, independent versus systemic. In the first dimension, simple knowledge refers to "little information" and easy to transfer while complex knowledge involves "the amount of factual information" that may "evoke more causal uncertainties." The second dimension is well known by the division of explicit and tacit proposed by Nonaka & Takeuchi (1995). The third dimension outlines the independent and systemic character of knowledge. De Long & Fahey (2000) distinguished knowledge into three types including human knowledge, social knowledge, and structured knowledge. What individuals know or know how to do refer to human knowledge including both tacit knowledge and explicit knowledge. The relationships between individuals or groups are to describe social knowledge. This type of knowledge is largely tacit because it refers to our ability to collaborate and develop transactional relationships. The concept of social knowledge, as used here, positions our chapter in the context of this book since we seek to capture the ability of adaptation of people when encountering a new culture. The third type, structured knowledge is explicit because it involves organizational systems, processes, rules and routines.

Knowledge Creation Theory

Knowledge Management is composed of various disciplines, such as psychology, philosophy, and sociology (Nonaka, 2005), or of various types such as technology, economy, and behavior (Earl, 2001). According to Nonaka, all the works on the creation, dissemination, and leveraging of knowledge to make groups or organizations successful can be classified as KM.

The key idea of Nonaka and Takeuchi (1995)'s work is the process of knowledge creation, which is described by SECI model (socialization, externalization, combination and internalization) (see Figure 1). In the first stage, the socialization of

Figure 1. SECI model (Nonaka & Takeuchi, 1995)



tacit transforms to knowledge that can be codified and transferred from tacit to explicit in the second stage called “externalization.” The third stage is to combine different “externalized” knowledge from the previous stage. This combination increases the amount of tacit knowledge which will be internalized in organization. The socialization of this new tacit knowledge is a virtuous cycle, which is considered as a process of knowledge creation.

Given the strong influence of this model on KM approach, Fink & Holden (2005, 2007) highlighted the weak play of SECI model in the context of the modern global economy. According to Glisby & Holden (2002, 2005), all four modes of the SECI model are culture-dependent and can be regarded in cross-cultural context. Weir & Hutchings (2005) argued that Glisby & Holden’s critique is correct, but they noted that SECI model also “contains valuable dimensions that do have cross-cultural application”. Gourlay (2006) listed “systematic criticism” of Nonaka and Takeuchi’s work, such as the lack of recognition of differences between scientific knowledge and corporate knowledge, as well as the conflicts

between different groups (Essers and Schreinemakers, 1997, cited by Gourlay, 2006). Gourlay suggested that “different kinds of knowledge are created by different kinds of behavior”, because his study recognized that the distinction between explicit knowledge and tacit knowledge of Nonaka and Takeuchi’s theory seems unclear. Gourlay then highlighted “know-how” and “know-that”, not only to well distinguish tacit knowledge and explicit knowledge but also to “include knowledge of which the knowers can and do tell and are consciously aware of.” According to Gourlay, this proposition corresponds to two modes of behavior, non-reflective and reflective behavior, which can explain the consequences of knowledge, as well as its degree and components. Rikowski (2007) even argued that SECI model is not necessarily spiral. She explained that physical, political, cultural and socio-technical barriers impede knowledge transfer and creation throughout organization.

The emphasis on dimensions of knowledge and knowledge creation theory as shown above would be able to better lead us to understand what

kind of knowledge cross-cultural knowledge could be, and to see if there is any relationship between the cross-cultural knowledge creation process and knowledge creation theory.

Relevant Concepts of Cross-Cultural Knowledge

Adler (2008) has summarized six different approaches of CCM research, including parochial, ethnocentric, polycentric, comparative, geocentric, and synergistic research. Parochial research is only applicable to management in one culture, and yet it is assumed to be applicable to management in many cultures. Ethnocentric research finds the answers for the question “How can management research be standardized across cultures?” Polycentric research focuses on the application of home country theories or models without using obtrusive measures. Comparative research refers to studies comparing organizations in many foreign cultures. Geocentric research looks into multinational companies. Synergistic research explores intercultural interaction within work settings. In this section, we present several studies referring to synergistic research, which explains the positive points of culture. We have placed this argument at the beginning of this section for the reason that this way of thinking will strongly influence our understanding of what cross-cultural knowledge means.

Cultural Knowledge

Choosing the reflection of the underlying nature of culture, Sackman (1991) used the cognitive perspective of the conception of culture in organizations to explain cultural knowledge. Suggesting that cultural knowledge is composed of dictionary knowledge, directory knowledge, recipe knowledge and axiomatic knowledge, Sackman (1991) argued that these types of knowledge correspond to the characteristic questions “what is”, “how are things done”, “should” and “why things are

done the way they are”. These types of knowledge can also be combined to create “experientially developed theory for understanding, explanation, and prediction”, according to Sackman (1991).

Cultural knowledge, as Sackman explained, has two main aspects: aspect of collectivity and aspect of learning capacity. The aspect of collectivity emerges “in different socialization processes: within the family, growing up in a specific region and country, belonging to a certain ethnic group, and having experienced a certain kind of education and professional training” when individuals “have learned and acquired over the years.” The aspect of leaning capacity describes the importation of cultural variety into the organization by new members. Sackman also emphasized that the requirements for obtaining cultural knowledge include mutual understanding, communication and effective coordination in a social system. Not only Sackman (1999) saw cultural base from the cognitive perspective, but also Weisinger and Salipante (2000) considered cultural knowledge as stable and cognitive, as residing in the individual’s mind, and believed that training people in the cultural assumptions of their counterparts would lead to more effective cross-cultural interaction. However, their results showed this view to be naive.

Also using the term “cultural knowledge”, O’Sullivan (1999) explained this term by presenting cross-cultural competence from “a fresh perspective”, by distinguishing between stable and dynamic cross-cultural competencies. O’Sullivan (1999) looked at Black and Mendenhall’s (1990) work on three dimensions of cross-cultural competencies, including the self-maintenance dimension, the relationship dimension, and the perceptual dimension. Based on existing literature, O’Sullivan considered cultural knowledge as a type of knowledge with various aspects such as a self-maintenance competency (factual knowledge), a cross-cultural relationship competency (conceptual knowledge), and perceptual competency. As Johnson et al., (2006, p. 532) noted, O’Sullivan’s perspective suggests that “all

employees are not equally trainable, and that there are some individuals who may lack the personality traits necessary for them to acquire certain knowledge and skills.”

Further, Hofstede (2001) divided cultural knowledge into two different types: cultural-general knowledge and culture specific. Culture-general knowledge focuses on awareness and knowledge of cultural differences. Such culture investigates “the participant’s own mental makeup and how it differs from that of others” (Johnson et al., p. 530). Culture specific focuses on specific knowledge about another culture.

Third Culture

Figure 2 shows third culture building model, presented by Casmir (1993). This model focused on “the successive phases of performance beneficial to both the individual and those with whom she or he is involved in interactions” and also showed “all internal and external aspects of the human experience” (p. 420).

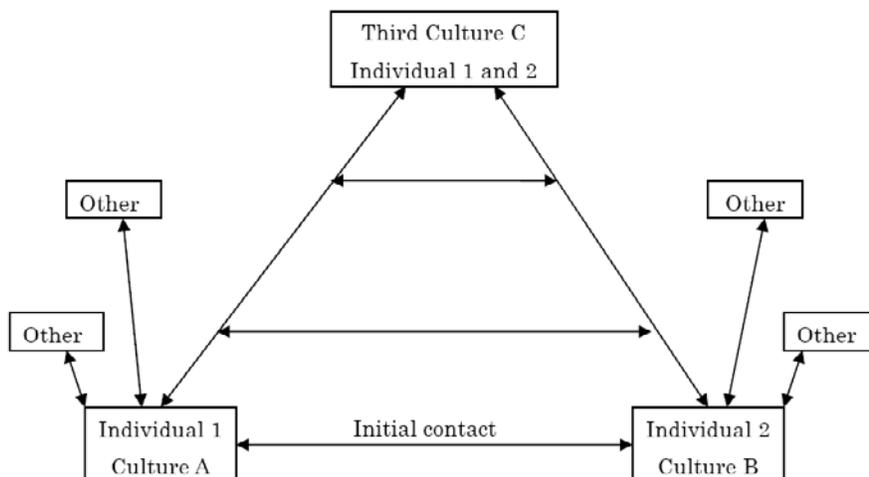
Although there have been some works on “third cultures” (e.g., Useem, Donoghue and Useem, 1963, cited in Casmir, 1993), as Casmir recognized, these works focused on the interactions

between sojourners and members of their host cultures only. Casmir’s work, interestingly, leads to “new, effective and mutually acceptable and beneficial third cultures through interactive intercultural processes”. His third culture model is built “based on cooperative, non-threatening, mutually beneficial interactions” (p. 417). This model, accordingly to Casmir, helps individuals adapt and adjust to their environment.

Hampden-Turner and Trompenaars (2000) didn’t use the term third culture but they suggest that when two cultures join together, they “manage cultural polarities and values dimensions that self-organize in systems to generate new meanings” (p. 27). These new meanings are also considered “third culture” as Casmir’s definition.

Creating a third culture is also highlighted by Graen & Hui (1996) as important in the relationship between two culturally different companies. A third culture, according to Graen & Hui (1996), is a bridge of two different cultures that may bring compromise between different cultural practices. Graen & Hui showed two kinds of differences in cultural values, nominal differences and systematic differences. Nominal differences, as Graen & Hui explained, are related to specific phenomena like language and customs. Systematic differences,

Figure 2. Third-culture building (Casmir, 1993, p. 421)



according to Graen & Hui, involve fundamental values, beliefs and philosophies of social regulation. Following that, Graen & Hui suggested that managing cross-cultural partnerships should manage both nominal and systematic differences in these partnerships. Graen & Hui also noted differences between the “third culture” and “two cultures”. Two cultures, as Graen et al. (1996) explained, “occur when the two cross-cultural business partners remain “strangers” to each other in the business relationship”. Stranger, is not understood in the usual way, but in Graen & Hui’s study, means that “these business partners do not have a quality relationship with each other”. The third culture, according to Graen & Wakabayashi (1994), is created to bridge and transcend the two cultures. The third culture helps both partners to “find ways to come up with organizational practices and management techniques and programs that are acceptable to members of both cultures.

The major characteristics of the two cultures and the third culture description are shown in Table 1. Graen & Hui (1996) stated that there is a mutual disinterest and a “cover-your-ass” (CYA) kind of attitude in “two cultures” relationships. This relationship is interested in short term only, so the business partners will compete and confront each other.

Based on a legal contract, the “two cultures” style may lead to contract breach. A win-lose situation is described in the relationship between

business partners. A third culture, as Graen & Hui (1996) explained, highlights mutual respect and trust. That leads to sharing long-term business, co-operation, and accommodation among partners. They should handshake and follow mutual obligations to make profits by win-win collaboration.

Cultural Synergy

According to Moran, Harris and Moran (2007), the term “synergy” is not easy to understand. Synergy, as they explained, involves a belief “that we can learn from others and others can learn from us” (p. 227). Following that, they described cultural synergy as “a dynamic approach to managing cultural diversity in a variety of contexts” (p. 228). Synergy in Schmidt’s (2006) view is a “cooperative or combined action that can occur when diverse or disparate groups of people with varying viewpoints work together”. Its power is to solve problems, as Surowiecki (2004; cited in Schmidt, 2006) explained that “groups are often smarter than the smartest people within them”.

Adler (2002) was probably one of the pioneers to emphasize this view, and according to her, cultural synergy can find new solutions to solve problems that “leverage the cultural differences among all cultures involved while respecting each culture’s uniqueness” (p. 127). Adler (2002) focused on describing “the situation from each culture’s perspective, culturally interpreting the situation, and developing new culturally creative solutions” (p. 118) of cultural synergy.

One further work on cultural synergy is worthy of note, because it argued that synergy is a dimension of organizational culture. Harris (2004) explained the term “synergy” as a dynamic process related to adaptation, learning and action. This process suggests that the total effect is greater than the sum of effects when acting independently, which can create an integrated solution. It also should be noted that this does not signify compromise, but it improves and enhances the

Table 1. Characteristics of “Two Cultures” and “Third Culture”

Two culture	Third culture
CYA	Trust
Compete	Co-operate
Confront	Accommodate
Short term	Long term
Legal contract	Handshake
Contract breach	Mutual obligation
Win/lose	Win/win

potential of members by facilitating the release of team energies.

Cultural Hybrid

Most works on cultural differences underline that a combination of different cultures must result in culture shock, friction and misunderstanding. Differently and more interestingly, Holden (2002) introduced a new view of CCM which focuses on a new cultural hybrid. Holden (2002) took a simple example from the combination of two chemicals, and then applied this combination to CCM.

$C1 + C2 = C3$

C1, C2: any given cultures except each other

C3: a new hybrid culture

With this description, Holden starts to glimpse reflections of CCM as a form of KM:

CCM is the management of multiple cultures and among organizations, involving processes of knowledge transfer and organizational learning. These activities facilitate the functioning of networks which are composed of an inconceivably large number of overlapping social and information networks linking people and organizations worldwide. The core task of CCM is to facilitate and direct synergistic action and learning at interfaces where knowledge, values and experience are transferred into multicultural domains of implementation (p. 58-59).

This research of Holden (2002) is highly appreciated by Claes (2004) because it emphasized the dynamics of cultural differences. Hybrid culture, at group level, has been explained by Earley & Gibson (2002, p. 113), as “a new shared understanding of team member status, team processes, role expectations, communication methods, and so on.” Such new understanding occurs from team

member interaction. Earley & Gibson also identify homogeneous and heterogeneous teams, which have impact on the formation of a hybrid team culture. While members in homogeneous teams can easily find existing commonalities to create a hybrid team culture, heterogeneous team members take time and efforts to form such new culture.

Cultural Change

Despite a number of studies on different values of cultures and their impact on behavior, there have been few studies on the influence of cultural change on change, as well as on the change of culture itself, as Erez and Gati (2004) noted. Culture can be changed, according to Erez and Gati, when it interacts with another culture via international trade, migration, and invasion. Erez and Gati (2004) also indicated that countries having high individualism, low power distance, and low uncertainty in national culture will adapt to the global work environment better than the other countries. Of course, this may explain why employees having experience in working for multinational companies adapt to cross-cultural work environment and maintain and develop a bi-cultural identity better than others. Actually, when globalization is increasing, it is easy to recognize that national cultures can also be influenced by global culture. For example, Dalton and Kennedy (2007) indicated that high power distance in Romania may be reduced by the impact of globalization and the adoption of Anglo-American values in management.

Notwithstanding, one important note by Chan (2002) is that most studies on cross-cultural organizational research focused on measurement and dimensions on cultural differences only. Another way of looking into cross-cultural studies is related to the issues concerning cultural change, according to Chan (2002). The reason why cultural change is not widely studied is the difficulty of changing a culture (Plessis, 2006). In fact, change is a “constant feature of all cultures” as well as

“a result of both internal and external forces” (Ferrano, 2006). The mechanisms of change are explained by Ferrano as discovery and invention in a specific culture. As “a result of borrowing from other cultures”, cultural change is understood by Ferrano as cultural diffusion. Each individual in a culture, according to Ferrano, can learn and get ideas from other cultures, while the background and time of each individual are always limited. The “process of spreading of cultural items from one culture to another” is also the process of cultural diffusion. This process is described by Ferrano as a selective process, because when one culture got another culture’s idea, they does not accept “everything indiscriminately.” Consequently, we can understand why cultural differences exist forever.

Changing is not only a need but also a power of organizational culture according to Cameron and Quinn (2006). They emphasized that culture change is an appropriate response to rapid change in the external environment, such as the explosion of technology as well as of information.

Cultural Intelligence

In order to “understand why some people are more adept at adjusting to new cultural surroundings than others” (p. 59), Earley, Ang, & Tan (2003) developed and presented a theoretical model of “cultural intelligence”.

Both process and content features are described in this theoretical model. Three facets of this model, including cognitive, motivational and behavioral facets, are elements in the general structure. When an individual has a high level of cultural intelligence, they will have cognitive skills that help them function effectively in a new culture.

In addition, an individual with a high level of cultural intelligence always has a motivational impulsion to adapt to a different culture. Also, such people have adaptive behaviors to deal with a new culture. Specifically, two general categories of knowledge are also presented in this model: declarative knowledge refers to “information

about the characteristics of an entity” and procedural knowledge focuses on “the way something functions” (Earley, Ang, & Tan, 2003, p. 86). This theoretical model, however, emphasizes more learning than doing (Johnson et al., 2006). The behavioral component of Earley’s (2002) cultural intelligence, according to Johnson et al, (2006, p. 537), “appears to be concerned more with acquiring and practicing appropriate behaviors than with applying them in real-life.”

Cultural Competence

Lustig and Koester (1996) discussed competence and intercultural communication, and established boundaries between culture and communication. Culture, as Lustig and Koester (1996) defined, is composed of “a learned set of shared perceptions about beliefs, values, and norms, which affect the behavior of a relatively large group” (p. 35). Following this concept of culture, they developed the definition of intercultural communication as “a symbolic process in which people from different cultures create shared meanings” (p. 42). In this definition, the degrees of difference between dissimilar cultures is also pointed out, to lead to their understanding of intercultural communication as “a symbolic process in which the degree of difference between people in large and important enough to create dissimilar interpretations and expectations about what are regarded as competent behaviors that should be used to create shared meanings” (p. 50). The trait, perceptual, behavioral, and culture-specific approaches are used to explain the understandings of intercultural competence. The trait approach is used to “identify the kinds of personality characteristics in individual traits that allow a person to avoid failure and achieve success in intercultural encounters” (p. 55). As they explained, this approach emphasizes flexibility in thinking, psychological and social adjustment in one’s own culture and relativistic values. The perceptual approach is used to “identify clusters of attitudes or perceptions”

(p. 56). These attitudes or perceptions, in fact, include the ability to reduce psychological stress, to communicate effectively and to improve interpersonal relationships. Intercultural competence should include these abilities. The behavioral approach is used to identify specific communication behaviors during intercultural interactions, because the thoughts of people as well as their actual actions are studied in behavioral approach. The culture-specific approach is used to identify culture-specific perceptions and behaviors, because people's adaptation to the specific rules of interaction in a particular culture is explored in the culture-specific approach. In Lustig and Koester's work the components of intercultural competence, such as context, appropriateness and effectiveness, knowledge, motivations, and actions, are also investigated. These components, as Lustig and Koester suggested, can be used to improve intercultural competence.

Having a different view, Chiu et al., (2005) explained cultural competence as "distributed knowledge". Interestingly, the interconnections of individuals may produce, distribute and reproduce learned routines which are called organized knowledge. Culture, in Chiu et al.'s (2005) explanation, is to designate a coalescence of this organized knowledge. In fact, this argument followed Barth's (cited in Chiu et al., 2005) work which investigated how we make up our experienced, grasped reality and create learned routines of thinking, feeling and interacting with other people. Knowledge, according to Barth, provides people with materials for reflection and premises for action. These actions then become knowledge to others. In addition, they argued that these learned routines are not only personal knowledge in the heads of individuals but also are shared, albeit incompletely, among a delineated population.

On the way to finding an adequate model for Cross-Cultural Competence, Johnson et al., (2006) looked at the knowledge dimension, the skill dimension and the personal attributes dimension as three components in Cross-Cultural Competence.

Based on the existing literature, such as Imahori and Lanigan (1989) and Redmond and Bunyi (1993), the knowledge dimension of cross-cultural competence is composed of "the knowledge about culture, knowledge of language, and knowledge about the rules of interactions" (p. 530).

Cultural Diversity

Focusing on learning the dynamics of diversity, as well as developing competency to manage diversity in organizations, Cox (2001) investigated how to create an effective multicultural organization. Considering diversity as "any difference between people such as the difference in gender, in race, in national origin, in birth rates, in work groups, in organizational level and in work specializations" (cited in Nguyen et al., 2008, p. 111), Cox (2001, p. 3) defines this term as "the variation of social and cultural identities among people existing together in a defined employment or market setting". However, Cox also noted a problem of diversity: potential performance barriers caused by conflicts and misunderstandings in communication. Importantly, many opportunities can be found when using diversity in organizations. Cox found that diversity can add five values to organizations. Having a broader and richer base of experience from diverse groups, as well as improving the competence of analysis in decision-making group is the first value that organizations may get from diversity. Organizations also improve and enhance creativity and innovation through diversity, such as high levels of innovation from the diversity in a workforce (Kanter, 1983, cited in Cox, 2001), or a resource if skillfully managed (Iles, cited in Cox, 2001). The third value that diversity adds to organizations is organizational flexibility. As Cox explained, diversity promotes the competence of languages and increases flexibility of thought of members in organizations, which can make the organization more flexible. The fourth value added to an organization is human talent emerging from diverse workers. Finally, diversity can improve

marketing strategy for an organization. Beyond the above advantages of cultural diversity recognized by Cox (2001), Iles (1995) also highlighted the power of cultural diversity by focusing on learning to work with differences.

In this section, we have reviewed cross-cultural perspectives couched in several terms, such as hybrid culture, cultural synergy, third culture, cultural knowledge, cultural competence, cultural intelligence, cultural change and cultural diversity, which have resulted in the adaptation and adjustment process. This process has been given typically the term “acculturation” (Berry, 1980, 1990; Bourhis et al., 1997; Kim, 2005). Importantly, these characteristics match the concept of knowledge that we have discussed as earlier. Our explanation of the perception “culture as knowledge” is summarized in Table 2.

TOWARDS AN UNDERSTANDING OF CROSS-CULTURAL KNOWLEDGE MANAGEMENT

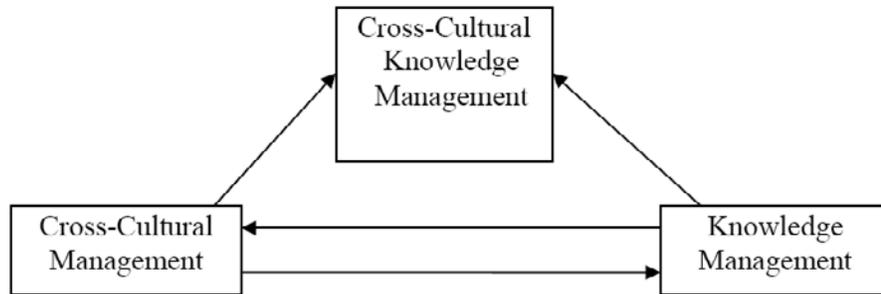
Cross-Cultural Knowledge Management (CCKM) has been noted as a poly-semantic term, because this term has been explored in two ways of understanding (Nguyen & Umemoto, 2009; Nguyen, Umemoto & Medeni, 2007). First, CCKM can be understood as knowledge management in a cross-cultural environment. Second, this term may be considered as the management of cross-cultural knowledge. This exploration can be summarized in the Figure 3.

Following the above understandings of CCKM, the term “Cross-Cultural Knowledge Management” refers to the management and the creation of a new culture adept at adjusting to cultural differences. As such, CCKM is defined as:

Table 2. Cross-cultural perspectives on reflection as knowledge

Cross-cultural Perspectives	Characteristics	Knowledge
Cultural Knowledge	aspect of collectivity and the capacity of leaning through mutual understanding, communication, and effective coordination in a social system, aspect of self-maintenance, relationship and perceptual competencies	the individual’s competence of adding value by exercising judgment and drawing distinctions among information from a particular context, of creating of shard beliefs, of recognizing (know-what), of acting (know-how), understanding (know-why), and of developing new meanings to create new insights corresponding to a target situation.
Hybrid Culture	synergistic action and learning created in the processes of knowledge, values and experience transfer among people of different cultures	
Cultural Synergy	new culturally creative solution which are developed from cooperative and combined actions	
Third Culture	a new culture which is created from “cooperative, non-threatening, mutually beneficial interactions”	
Cross-Cultural Competence	the abilities of identifying “clusters of attitudes or perceptions,” such as reducing psychological stress, or improving interpersonal relationships	
Cultural Intelligence	the adaptation and adjustment to a new cultural environment	
Cultural Change	learn and get ideas from other cultures	
Cultural Diversity	adding values in decision making, promoting creativity and innovation improving cognitive flexibility, or “attracting, retaining, and using the skills of diverse workers”	

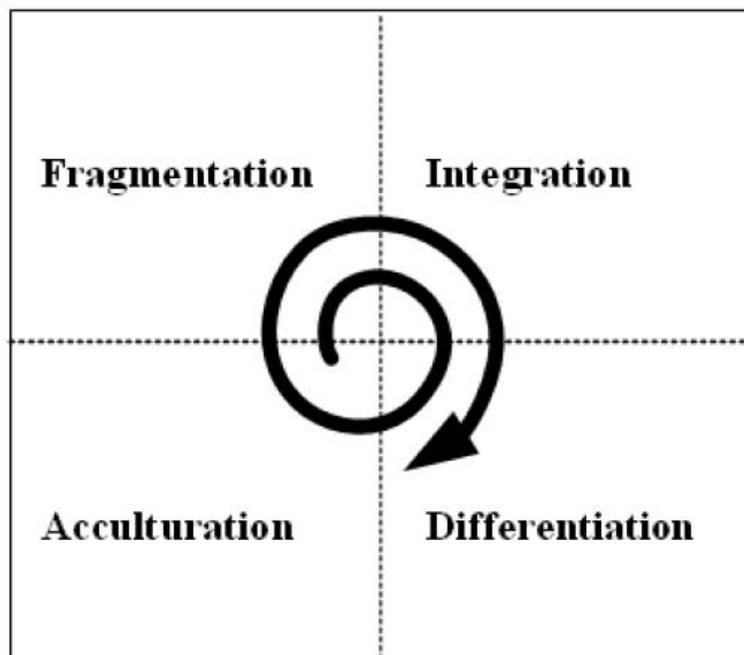
Figure 3. An understanding of cross-cultural knowledge management



Cross-Cultural Knowledge Management (CCKM) is composed of a series of practices to recognize cultural differences, using awareness and understanding of cultural differences to develop a new culture adept at adjusting to cross-cultural environments. This new culture improves and enhances Knowledge Management activities (Nguyen, Umemoto & Medeni, 2007, p. 35).

In this definition, the positive views of cultural differences are pointed out. Also, the potential of culture as a knowledge management tool is well noted. Especially, this definition is a combination of two disciplines, CCM and KM. While Fink & Mayrhofer (2001) said that other disciplines may provide additional insights on the importance of the interdisciplinary challenge, we believe that this definition of CCKM highlights the additional insights of CCM in KM, as well as KM in CCM.

Figure 4. Proposed theoretical model of Cross-Cultural Knowledge Management



A THREE-PERSPECTIVE CULTURE APPROACH

Here we present Martin's (2002) three perspectives of culture, including integration, differentiation and fragmentation. Fragmentation, integration and differentiation are used to describe the phenomena in an organizational culture. The fragmentation perspective describes such phenomena as ambiguity, uncertainty, confusion and contradictions of values and beliefs existing in an organization. The differentiation perspective emphasizes phenomena of inconsistency caused by the separate and distinct values of sub-cultures in organization. The integration perspective refers to phenomena of stability, coherence, and consensus, such as "an oasis of harmony and homogeneity" of values and beliefs shared throughout an organization.

These three perspectives of culture, as Martin pointed out, can be taken together. Martin even clearly argued that taking three perspectives together is much better than using only one perspective, because one perspective supplements the others, and all three were useful for the analysis of studies on organizations. All these above perspectives, as Martin said, may be well applied to describe fundamental processes of other disciplines. In fact, some studies already used this three-perspective theory of culture to examine a variety of contexts, such as the birth of a culture in a company or the relationship between culture and innovation (Martin, 2002), linking these three cultural types to the cultural change processes (Meyerson & Martin, 1987), or applying this three dimensional framework to build a culture cube (Payne, 2001).

THEORETICAL MODEL OF CROSS-CULTURAL KNOWLEDGE MANAGEMENT

Based on three perspectives of culture, we propose some ideas for a theoretical model of Cross-

Cultural Knowledge Management (see Figure 4). Our reasoning goes as follows: the starting point in cross-cultural knowledge creation begins with fragmentation. We assumed that the ambiguities and uncertainties as the result of cultural differences may occur at first when individuals or organizations encounter a new culture. To overcome such ambiguities and uncertainties, people tend to arrive at harmony and homogeneity of that new culture by sharing values and beliefs. This stage refers to integration, which helps people of a culture to better understand other cultures. Although people have tried to integrate to a new culture, the differences within departments and professions (sub-cultures) in an organization will appear then. These differences are in the differentiation process. After that, individuals and organizations adjust and adapt to the cross-cultural environment by creating a new culture, which adds values from two or various cultures. We used the term "acculturation" to describe these adjustments and adaptations, as the last stage of a cross-cultural knowledge creation cycle.

After a cross-cultural knowledge creation cycle, however, other ambiguities and uncertainties will appear, because as we noted in the previous section, cultural differences exist forever. This means that cross-cultural knowledge creation starts a new cycle. Therefore the process of cross-cultural knowledge creation should be understood as a spiral.

Linking a Three-Perspective Culture Approach to SECI Model

This part explains some linkages between three perspectives of culture and SECI model. This will clarify the impact of each perspective on the knowledge creation process.

As we presented in the previous section, Ikujiro Nonaka and his colleagues (Nonaka, 1991; Nonaka et al., 1994; Nonaka and Takeuchi, 1995) created a dynamic model to describe the creation of knowledge in organizations in the early 1990s.

As is now widely accepted, this model has become “one of the most cited theories in the knowledge management literature” (Choo & Bontis, 2002, p. 12). There have been some studies which noted that the SECI model can not be applied to a cross-cultural environment. For example, Glisby & Holden (2002) have argued that Nonaka & Takeuchi’s four modes are “culture-dependent, each reflecting well-documented aspects of Japanese organizational behavior” (cited in Fink & Holden, 2007). Glisby & Holden then highlighted that SECI model cannot be applied to cross-cultural knowledge creation related to non-Japanese protagonists. Our proposed model of cross-cultural knowledge creation, in Figure 4, suggests that the process of creating cross-cultural knowledge goes through four stages, including fragmentation, integration, differentiation, and acculturation. Interestingly, we found out that fragmentation, integration and differentiation have special links with conditions that Nonaka and Takeuchi noted for their knowledge creation model.

Therefore, in this section, we will show interesting connections between CCKM and SECI model (Nguyen, 2007). First, we go beyond the content of socialization and focus on the way in which integration is related to its content. While the characteristics of the socialization process describe the same value-sharing of members in an organization, it is closely related to the integration perspective which also involves “an oasis of harmony and homogeneity” of values and beliefs shared throughout an organization. Moreover, they said that the stage of externalization is integral, because “the externalization of knowledge often helps people to see that the same phenomena can be viewed in many different and contrasting ways.” This means that the integration stage in our proposed model of CCKM may contribute to the socialization and externalization stage of SECI model, accordingly.

Second, Nonaka and Toyama (2004, p. 99) also portrayed the externalization process through “dialogues, contradiction between one’s tacit

knowledge and the structure, or contradictions among tacit knowledge.” These contradictions are often caused by the differences of sub-cultures such as different jobs and different levels which are described as the differentiation stage in our suggested model of CCKM presented above. Additionally, in the process of conversion of tacit knowledge into explicit knowledge, Nonaka emphasized the use of metaphor. Metaphor, as Nonaka explained, is “a distinctive method or perception”, an effective way “for individuals grounded in different contexts and with different experiences to understand something intuitively through the use of imagination and symbols without need for analysis or generalization.” These different contexts and different experiences are exactly described in the differentiation stage of the above proposed CCKM model. Thus, differentiation may also be included in the contribution of externalization in Nonaka & Takeuchi’s knowledge creation model as well.

Third, we will look at the conditions for organizational knowledge creation suggested by Nonaka and Takeuchi. Here, the conditions for promoting the knowledge spiral are fluctuation and creative chaos. As Nonaka & Takeuchi explained, when there is a fluctuation in organization, all members may “face a breakdown of routines, habits or cognitive frameworks”. However, this breakdown, according to Nonaka & Takeuchi, is a necessity for organizations, because it is considered as “a means of social interaction helping us to create new concepts”. Besides, top management also uses chaos to “give employees a sense of crisis as well as lofty ideal”. In Japan, for example, Japanese top managers usually use the ambiguity and creative chaos in their companies. While fragmentation perspective has been seen as “a treatment of ambiguity”, we can consider its role in enabling conditions improving and enhancing the process of knowledge creation.

Leadership through a Looking-Glass of the Three-Perspective Culture Approach

Leadership appears in any books focusing on KM, and also plays an important role in CCM. The emergence of CCKM from the combination of CCM and KM suggests that we should think about the role of leadership in CCKM, since leadership has effects on both KM and CCM (Nguyen & Umemoto, 2009). Beyond the creation of cross-cultural knowledge based on three perspectives of culture, the influences of leadership on each of these perspectives will be found in the existing literature of leadership.

First, the influence of leadership on fragmentation will be discussed through its impacts on ambiguities and uncertainties. In efforts to create visions and values through communication, according to Charteris-Black (2007), leadership usually uses metaphors as verbal strategies. Metaphor, as Charteris-Black explained, represents a linguistic result “from the shift in the use of a word or phrase from a context or domain in which it is expected to occur to another context or domain where it is not expected to occur, thereby causing semantic tension” (p. 42). This means that an implied change in the sense of words when we use metaphor is effective not only in communicating leadership as Charteris-Black described, but also in creating a network of new concepts (Nonaka, 2002). Moreover, using metaphor can help personal inner-visions to become closely connected with outer social realities. Although using metaphors can not avoid barriers of religions and politics, it could satisfy the psycho-emotional needs of followers (Charteris-Black, 2007). Especially, as “a distinctive method of perception” (Nonaka, 2002), metaphor can create single and contradictory things and ideas from two different and distant areas of experiences. In the previous section, we also mentioned Nonaka & Takeuchi’s discussion about the role of metaphor in creating a new meaning that can become a grand concept

for organizations. In addition, chaos and fluctuations are considered as other necessary conditions for knowledge creation in his very famous SECI model of the knowledge creation process. According to Nonaka & Takeuchi, ambiguities can lead to a reflection or questioning of values for top management.

In order to emphasize the importance of managing uncertainty, Hogg (2001) even said that managing uncertainty is necessary to maintain and strengthen leadership’s position. If leaders have a clear prediction on a prototype, they will control uncertainty well. But Hofstede (2001) found a correlation between national culture and uncertainty. There are two types of countries, according to Hofstede: countries with high uncertainty avoidance and low uncertainty avoidance. People in countries with low uncertainty avoidance easily accept uncertainty, because they consider uncertainty as an inherent aspect of life and take it in their stride (Fatehi, 2008). Consequently, leadership can use democratic-participative management when working in these cultures. People in these cultures normally want to have more autonomy and freedom, so they should be able to participate in decision-making. Thus, giving followers enough direction and instruction to adequately achieve their task is the way leadership can deal with uncertainty, according to Fatehi. In fact, Grote & Weichbrodt (2007) have already studied how to manage uncertainty at the organizational level by suggesting using flexible routines. Their study indicated that if leadership uses many tight rules, it will not help individuals in the organization adapt to a new environment. Besides, Cyert and March (1963, cited in Hofstede, 2002) proposed a way to manage uncertainty at the organizational level through building decision rules based on short-run reaction to short-run feedback, and imposing plans that can be made self-confirming by some control device. These rules and plans should be built independently, without prediction of uncertain future events. We suggest that this uncertainty management may be applied to the

fragmentation stage in cross-cultural knowledge creation process. For example, using short-run rules for new members from other countries, or other organizations, or other departments, or other groups, may help them integrate to the new environment. Also, short-run rules help leadership get feedback quickly. As a result, leadership can establish new rules and instructions based on this feedback. Therefore, using short-run rules and instructions is a good strategy which meets the requirements of change.

Second, we demonstrate the impact of leadership on the integration of both individual and organizational level. When Cox (2001) described five components of a model for cultural change including leadership, research and measurement, education, alignment of management systems, and follow-up, he emphasized the important role of leadership for cultural change in an organization. Leadership should have management philosophy, vision, organization design, personal involvement, communications strategy, and strategic integration. Among these important characteristics of leadership, having strategic integration is recognized by Cox as one of the most decisive conditions for successful change in an organization. To have a good strategy of integration, leadership should explain the existing diversity in an organization. As already mentioned, diversity is an organizational potential, but also increases difficulties in task coordination (Zenger and Lawrence, cited in Tsai, 2005). To help their employees understand the impact of profitability on diversity, leadership should take the initiative to send the message with conviction. Conviction, however, should be built based on trust. Without trust, leadership and employees/followers will fail in building strategy integration. In fact, there have been many studies which emphasized that trust is an effective factor for leadership to build effective relationships among members and units in an organization (Hitt et al., 2003; Grisham, 2005). In addition, the dimension of individualism versus collectivism in national cultures also decides

the integration of members in an organization. For example, it may take time for people having individualistic national culture to integrate to the new environment because they are not familiar with collectivist culture. In contrast, it is easy for people having a collectivist culture to integrate into new organizations.

Third, we will add two main points focusing on the influence of leadership on differentiation. First, we discuss how cultural differences should be recognized by leadership. As Adler (2002, p.107) pointed out, the recognition of cultural differences does not mean “judging people from one culture to be better or worse than those from other cultures”. Judging cultural differences, according to Adler (p. 107), may cause “inappropriate, offensive, racist, sexist, and ethnocentric attitudes and behavior”. Also, Adler has not appreciated cultural blindness. As Adler explained, when North American managers usually blind themselves to gender, race, sex, and ethnicity and judge employees only based on professional skills, the confusion of the recognition of cultural differences with the judging of those same differences may occur. Understanding cultural differences is suggested as one of the best recognitions of cultural differences. Understanding cultural differences helps managers limit the problems caused by cultural diversity. Also, understanding cultural differences helps leadership appreciate the opportunities of diversity. The opportunities of diversity, for example, potential performance and added values such as problem solving, creativity and innovation, organizational flexibility, human talent, and marketing strategy have been discussed in previous cultural diversity section. Interestingly, the problems of understanding “real diversity” lead to understanding cultural differences, as Cox recognized that when new employees go to a new organization or group, they tend to modify their attitudes and behaviors to achieve acceptance of the majority of members in that organization or group. Employees usually feel “pressure to conform” to existing organizational culture.

This characteristic is similar to the integration stage, as we explained in our proposed model of cross-cultural knowledge creation process; people always try to integrate when they enter a new environment. In this context, integration is seen as a hidden step in coping with cultural differences. The important task of leadership is to see and recognize the hidden attitudes and behavior of employees, when they try to modify or hide these hidden attitudes. To do so, leadership may express their appreciation of cultural differences to their employees by showing that cultural differences can contribute to the development of their organization. In such a case, employees are ready to express their differences.

Not only playing an important role in managing cultural differences, leadership also creates differentiation in organizations. Of course, leadership can not create differences in national culture if their organization is not a multi-national company. However, while culture can be seen at multiple levels such as national level, organizational level, professional level, occupational level, and group level, leadership can create different professions, different occupations, different departments, and different groups. Creating cross-functional teams, for example, is also a type of creating differentiation in an organization. Specifically, a new culture can be created from the diversity of cross-functional teams (Parker, 1994). Also, there exists another type of creating differentiation, which proposes “shared leadership” strategy. Leadership is divided by Cox et al., (2003) into two types, appointed or emergent team leader, and shared leadership. Shared leadership, as the team itself, allows every member in groups or organizations to participate in decision-making. As a result of the age of complexity in technology, this strategy improves and enhances mutual adjustment of all members who have different positions in organizations (Kruglianskas and Thamhain, 2000, cited in Cox et al., 2003).

Although differentiation can be a business advantage, it can cause conflicts for organiza-

tions. In Bryant’s (2003) work, differentiation is divided into two types: hyper-differentiation and de-differentiation. While hyper-differentiation brings “alive contradictory tendencies”, de-differentiation may “involve bridging the relentless fragmentation of recursive specialism” (p. 7). This is also the reason why leadership should control the measurement of differentiation, because the distance between collaboration and conflict is very slight. Day and Lance (2004) already noted that forcing the organization or group to integrate and coordinate may increase differentiation. Not only differentiation, but also integration should be well controlled, as Day and Halpin (2004) explained, as they are considered to be the core components of complexity.

CONCLUSION

This chapter provides fresh insights into the significant existence of CCKM. We advance several concepts in CCM and relate them to the concept of knowledge in KM to develop the perception “culture as knowledge”. This perception thus defines our understanding of CCKM as the interaction between CCM and KM. Most importantly, this chapter develops the essential elements of a theory of the cross-cultural knowledge creation process focusing on four stages: fragmentation, integration, differentiation and acculturation. In particular, this chapter also shows the role of leadership in this process. We hope to further conceptual and empirical research in this very new field. In particular, this new field will provide a framework when studying social phenomena in organizations.

ACKNOWLEDGMENT

This work is supported by Japan Society for the Promotion of Science (JSPS).

REFERENCES

- Aadne, J. H., Krogh, G. V., & Roos, J. (1999). Representationism: The Traditional Approach to Cooperative Strategies. In Krogh, G. V., & Roos, J. (Eds.), *Managing Knowledge: Perspectives on Cooperation and Competition* (pp. 9–31). London: Sage Publications.
- Adler, N. J. (1983). Cross-Cultural Management Research: The Ostrich and the Trend. *Academy of Management Review*, 8(2), 226–232. doi:10.2307/257749
- Adler, N. J. (2002). *International Dimensions of Organizational Behavior* (4th ed.). Cincinnati, OH: South-Western.
- Alvesson, M. (2004). *Knowledge Work and Knowledge-Intensive Firms*. New York: Oxford University Press.
- Balmisse, G. Meingan, D., & Passerini, K. (2008). Technology Trends in Knowledge Management Tools. In O'Sullivan, K. (Ed.), *Knowledge Management in Multinational Organizations* (pp. 152–165). Hershey, PA: Information Science Reference.
- Berry, J. W. (1980). Marginality, Stress and Ethnic Identification in an Acculturated Aboriginal Community. *Journal of Cross-Cultural Psychology*, 1, 239–252. doi:10.1177/135910457000100303
- Berry, J. W. (1990). Psychology of Acculturation: Understanding Individuals Moving between Cultures. In Brislin, R. (Ed.), *Applied Cross-Cultural Psychology* (pp. 232–253). Newbury Park, CA: Sage Publications.
- Bhagat, R. S., Kedia, B. L., Harveston, P. D., & Triandis, H. C. (2002). Cultural Variations in the Cross-Border Transfer of Organizational Knowledge: An Integrative Framework. *Academy of Management Review*, 27(2), 204–221. doi:10.2307/4134352
- Bourhis, R., Moiese, L., Perreault, S., & Senecal, S. (1997). Towards An Interactive Acculturation Model: A Social Psychological Approach. *International Journal of Psychology*, 32, 369–686. doi:10.1080/002075997400629
- Bryant, J. (2003). *The Six Dilemmas of Collaboration: Inter-organizational Relationships as Drama*. London: John Wiley & Sons.
- Casmir, F. L. (1993). Third-Culture Building: A Paradigm Shift For International and Intercultural Communication. *Communication Yearbook*, 16, 407–428.
- Chan, D. (2002). Questions about Change over Time in Cross-Cultural Organizational Research. *Asia Pacific Journal of Management*, 19, 449–457. doi:10.1023/A:1016256122279
- Charteris-Black, J. (2007). *The Communication of Leadership: The Design of Leadership Style*. New York: Routledge.
- Chemers, M. M. (2000). Leadership Research and Theory: A Functional Integration. *Group Dynamics*, 4(1), 27–43. doi:10.1037/1089-2699.4.1.27
- Chiu Chi-Yue et al. (2005). Cultural Competence: Dynamic Processes. In Elliot, A. J. (Ed.), *Handbook of Competence and Motivation* (pp. 489–504). The Guilford Press.
- Choo, C. W. (2006). *The Knowing Organization: How Organizations Use Information to Construct Meaning, Create Knowledge, and Make Decision* (2nd ed.). New York: Oxford University Press.
- Choo, C. W., & Bontis, N. (2002). Knowledge, Intellectual Capital, and Strategy: Themes and Tensions. In Choo, C. W., & Bontis, N. (Eds.), *The Strategic Management of Intellectual Capital and Organizational Knowledge* (pp. 3–19). New York: Oxford University Press.

- Claes, M. (2004). The Interaction between Organizational Culture and National Culture, presentation in *Organizational and Professional Cultures and Diplomacy*, Malta, 13-15 February.
- Cook, S. D. N., & Brown, J. S. (2005). Bridging Epistemologies: The Generative Dance between Organizational Knowledge and Organizational Knowing. In Little, S., & Ray, T. (Eds.), *Managing Knowledge: An Essential Reader* (2nd ed., pp. 51–84). London: Sage Publications.
- Cox, J. F. (2003). Toward a Model of Shared Leadership and Distributed Influence in the Innovation Process. In Pearce, C. L., & Conger, J. A. (Eds.), *Shared Leadership: Reframing the Hows and Whys of Leadership* (pp. 48–68). Thousand Oaks, CA: Sage Publications.
- Cox, T. J. (2001). *Creating the Multicultural Organization*. San Francisco: Jossey-Bass.
- Davenport, H. T. (1997). *Information Ecology*. New York: Oxford University Press.
- Davenport, T., & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Harvard Business School Press.
- Day, V. D., & Halpin, M. S. (2004). Growing Leaders for Tomorrow: An Introduction. In Day, D. V., Zaccaro, S. J., & Halpin, M. S. (Eds.), *Leader Development for Transforming Organizations: Growing Leaders for Tomorrow* (pp. 3–22). New Jersey: Lawrence Erlbaum Associates Publisher.
- Day, V. D., & Lance, E. C. (2004). Understanding the Development of Leadership Complexity through Latent Growth Modeling. In Day, V. D., Zaccaro, S. J., & Halpin, M. S. (Eds.), *Leader Development for Transforming Organizations: Growing Leaders for Tomorrow* (pp. 41–70). New Jersey: Lawrence Erlbaum Associates Publisher.
- DeLong, D. W. (2000). Diagnosing Cultural Barriers to Knowledge Management. *The Academy of Management Executive*, 14(4), 113–127.
- Drucker, P. (1993). *Post-capitalist Society*. Oxford: Butterworth-Heinemann.
- Earl, M. (2001). Knowledge Management Strategies: Toward A Taxonomy. *Journal of Management Information Systems*, 18(1), 215–233.
- Earley, P. C., Ang, S., & Tan, (2003). *Cultural Intelligence: Individual Interaction across Cultures*. California: Stanford University Press.
- Earley, P. C., & Gibson, C. B. (2002). *Multinational Work Teams: A New Perspective*. New Jersey: Lawrence Erlbaum Associates Publishers.
- Earley, P. C., & Singh, H. (1995). International and Intercultural Management Research: What's Next? *Academy of Management Journal*, 38(2), 327–340. doi:10.2307/256682
- Erez, M., & Gati, E. (2004). A Dynamic Multi-Level Model of Culture: From the Micro Level of the Individual to the Macro Level of a Global Culture. *Applied Psychology: An International Review*, 53(4), 583–598. doi:10.1111/j.1464-0597.2004.00190.x
- Fatehi, K. (2008). *Managing Internationally: Succeeding in a Culturally Diverse World*. Thousand Oaks, CA: Sage Publications.
- Ferrano, G. P. (2006). *The Cultural Dimension of International Business*. New Jersey: Pearson Prentice Hall.
- Fink, G., & Holden, N. (2007). Cultural Stretch: Knowledge Transfer and Disconcerting Resistance to Absorption and Application. In Pauleen, J. D. (Ed.), *Cross-Cultural Perspectives on Knowledge Management* (pp. 67–80). Westport, CT: Libraries Unlimited.
- Firestone, J. M., & McElroy, M. W. (2003). *Key Issues in the New Knowledge Management*. Burlington, MA: Butterworth-Heinemann.

- Geisler, E. (2008). *Knowledge and Knowledge Systems: Learning from the Wonders of the Mind*. Hershey: IGI Publishing.
- Glisby, M., & Holden, N. (2002). Contextual Constraints in Knowledge Management Theory: The Cultural Embeddedness of Nonaka's Knowledge-Creating Company. *Knowledge and Management Process, 10*(2), 1–8.
- Glisby, M., & Holden, N. (2005). Applying Knowledge Management Concepts to the Supply Chain: How a Danish Firm Achieved a Remarkable Breakthrough in Japan. *The Academy of Management Executive, 19*(2), 85–89.
- Gourlay, S. (2006). Conceptualizing Knowledge Creation: A Critique of Nonaka's Theory. *Journal of Management Studies, 43*(7), 1415–1436. doi:10.1111/j.1467-6486.2006.00637.x
- Graen, G., & Hui, C. (1996). Managing Changes in Globalizing Business: How to Manage Cross-Cultural Business Partners. *Journal of Organizational Change Management, 9*(3), 62–72. doi:10.1108/09534819610116637
- Graen, G. B., Hui, C., & Wakabayashi, M. (1996). Cross-Cultural Research Alliances in Organizational Research: Cross-Cultural Partnership-Making in Action. In Early, C., & Erez, M. (Eds.), *Cross-Cultural Research in I/O Psychology*. San Francisco, CA: Jossey-Bass.
- Graen, G. B., & Wakabayashi, M. (1994). Cross-Cultural Leadership-Making: Bridging American and Japanese Diversity for Team Change. In Triandis, H. C., Dunnette, M. D., & Hough, L. M. (Eds.), *Handbook of Industrial and Organizational Psychology (Vol. 4, pp. 415–446)*. New York: Consulting Psychologist Press.
- Grisham, T. (2005). *Cross-Cultural Leadership, doctoral dissertation*. Retrieved December 1, 2007, from <http://adt.lib.rmit.edu.au/adt/uploads/approved/adt-VIT20061116.125205/public/02whole.pdf>
- Grote, G., & Weichbrodt, J. C. (2007). Uncertainty Management through Flexible Routines in a High-Risk Organization. *2nd Annual Cambridge Conference on Regulation, Inspection & Improvement-The End of Zero Risk Regulation: Risk Toleration in Regulatory Practice*. Cambridge, UK.
- Hampden-Turner, C. M., & Trompenaars, F. (2000). *Building Cross-Cultural Competence: How to Create Wealth from Conflicting Values*. West Sussex: John Wiley & Sons Ltd.
- Harris, R. P. (2004). European Leadership in Cultural Synergy. *European Business Review, 16*(4), 358–380. doi:10.1108/09555340410546991
- Hicks, R. C., Dattero, R., & Galup, S. D. (2007). A Metaphor for Knowledge Management: Explicit Islands in a Tacit Sea. *Journal of Knowledge Management, 11*(1), 5–16. doi:10.1108/13673270710728204
- Hitt, M. A. (2003). Strategic Leadership in Global Business Organizations: Building Trust and Social Capital. In Mobley, W. H., & Dorfman, R. W. (Eds.), *Advances in Global Leadership* (pp. 9–36). Oxford: Elsevier.
- Hofstede, G. (2001). *Culture's Consequences* (2nd ed.). California: Sage Publications.
- Hogg, M. A. (2001). A Social Identity Theory of Leadership. *Personality and Social Psychology Review, 5*(3), 184–200. doi:10.1207/S15327957P-SPR0503_1
- Holden, L. N. (2002). *Cross-Cultural Management: A Knowledge Management Perspective*. Harlow: Financial Times.
- Iles, P. (1995). Learning to Work With Differences. *Personnel Review, 24*(6), 44–61. doi:10.1108/00483489510097958

- Imahori, T. T., & Lanigan, M. L. (1989). Relational Model of Intercultural Communication Competence. *International Journal of Intercultural Relations*, 13(3), 269–286. doi:10.1016/0147-1767(89)90013-8
- Johnson, J. P., Lenartowicz, T., & Apud, S. (2006). Cross-Cultural Competence in International Business: Toward a definition and a model. *Journal of International Business Studies*, 37, 525–543. doi:10.1057/palgrave.jibs.8400205
- Kalpic, B., & Bernus, P. (2006). Business Process Modeling through the Knowledge Management Perspective. *Journal of Knowledge Management*, 10(3), 40–56. doi:10.1108/13673270610670849
- Kayes, D. C. (2005). Essential Competencies for Cross-Cultural Knowledge Absorption. *Journal of Managerial Psychology*, 20(7), 578–589. doi:10.1108/02683940510623399
- Liew, A. (2007). Understanding Data, Information, Knowledge and Their Inter-Relationship. *Journal of Knowledge Management Practice*, 8(2). Retrieved April 5, 2009 from <http://www.tlinc.com/articl134.htm>
- Lustig, W. M., & Koester, J. (1996). *Intercultural Competence: Interpersonal Communication across Cultures* (2nd ed.). HarperCollins College Publishers.
- Martin, J. (2002). *Organizational Culture: Mapping the Terrain*. California: Sage Publications.
- Meyerson, D., & Martin, J. (1987). Culture Change: An Integration of Three Different Views. *Journal of Management Studies*, 24, 623–647. doi:10.1111/j.1467-6486.1987.tb00466.x
- Moran, R. T., Harris, P. R., & Moran, S. V. (2007). *Managing Cultural Differences: Global Leadership Strategies for the 21st Century* (7th ed., pp. 231–259). Oxford: Elsevier Inc.
- Nguyen, T. B. N. (2007). Knowledge Management from Organizational Culture Perspectives. In *Proceedings of The 2nd International Conference on Knowledge, Information and Creativity Support Systems* (pp. 9-13). KICSS2007, Ishikawa, Japan.
- Nguyen, T. B. N., & Umemoto, K. (2009). Understanding Leadership for Cross-Cultural Knowledge Management. *The Journal of Leadership Studies*, 2(4), 23–35. doi:10.1002/jls.20078
- Nguyen, T. B. N., Umemoto, K., & Medeni, T. (2007). Towards a Theoretical Model of Cross-Cultural Knowledge Management. *International Journal of Knowledge, Culture and Change Management*, 7(9), 33–40.
- Nguyen, T. B. N., Umemoto, K., Nakamori, Y., & Ito, Y. (2009). Culture as Knowledge. *The International Journal of Knowledge, Culture and Change Management*, 8(9), 109–118.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
- Nonaka, I., & Takeuchi, H. (2004). Theory of Organizational Knowledge Creation. In Takeuchi H. & Nonaka, I. (Eds.), *Hitotsubashi on Knowledge Management* (pp.47-90). Singapore: John Wiley & Sons (Asia).
- Nonaka, I., & Toyama, R. (2004). Knowledge Creation as a Synthesizing Process. In Takeuchi, H. and Nonaka, I. (Eds.), *Hitotsubashi on Knowledge Management* (pp.91-124). Singapore: John Wiley & Sons (Asia).
- Nonaka, I., Toyama, R., & Konno, N. (2002). SECI, Ba and Leadership: A Unified Model of Dynamic Knowledge Creation. In Little, S., Quintas, P., & Ray, T. (Eds.), *Managing Knowledge: An Essential Reader* (pp. 23–50). London: Sage Publication.

O'Sullivan, S. L. (1999). The Distinction between Stable and Dynamic Cross-Cultural Competencies: Implications for Expatriate Trainability. *Journal of International Business Studies*, 30(4), 709–725. doi:10.1057/palgrave.jibs.8490835

Parker, M. G. (1994). *Cross-Functional Teams: Working with Allies, Enemies, and Other Strangers*. San Francisco: Jossey-Bass.

Payne, R. L. (2001). A Three Dimensional Framework for Analyzing and Assessing Culture/Climate and its Relevance to Cultural Change. In Cooper, C. L., Cartwright, S., & Earley, P. C. (Eds.), *The International Handbook of Organizational Culture and Climate* (pp. 105–122). West Sussex: John Wiley & Sons.

Plessis, M. D. (2006). *The Impact of Organizational Culture on Knowledge Management*. Chandos Publishing.

Probst, G., Buchel, B., & Taub, S. (1998). Knowledge as a Strategic Resource. In Krogh, G. V., Roos, & Kleine, D. (Eds.), *Knowing in Firms: Understanding, Managing, and Measuring Knowledge* (pp. 240–252). London: Sage Publications.

Redmond, M. V., & Bunyi, J. (1993). The Relationship of Intercultural Communication Competence with Stress and the Handling of Stress as Reported by International Students. *International Journal of Intercultural Relations*, 17(2), 235–254. doi:10.1016/0147-1767(93)90027-6

Rikowski, R. (2007). Knowledge Management Within and Across Cultures and Cultural Theories. In Rikowski, R. (Ed.), *Knowledge Management: Social, Cultural and Theoretical Perspectives* (pp. 135–148). Oxford: Chandos Publishing.

Sackman, S. A. (1991). *Cultural Knowledge in Organizations: Exploring the Collective Mind*. Newbury Park, CA: Sage Publications.

Sanchez (2004). Retrieved April 5, 2009 from <http://www.knowledgeboard.com/download/3512/Tacit-vs-Explicit.pdf>

Tsai, S. F. (2005). Composite Diversity, Social Capital, and Group Knowledge Sharing: A Case Narration. *Knowledge Management Research and Practice*, 3, 218–228. doi:10.1057/palgrave.kmrp.8500075

Tsoukas, H. (2005). *Complex Knowledge: Studies in Organizational Epistemology*. New York: Oxford University Press.

Tsoukas, H., & Vladimirou, E. (2005). What Is Organizational Knowledge. In Little, S., & Ray, T. (Eds.), *Managing Knowledge: An Essential Reader* (2nd ed.). London: Sage Publications.

Wiig, K. (2004). *People-Focused Knowledge Management: How Effective Decision Making Leads to Corporate Success*. Burlington: Elsevier Butterworth-Heinemann.

KEY TERMS AND DEFINITIONS

Cross-Cultural Knowledge: A new culture adept at adjusting to cultural differences.

Cross-Cultural Knowledge Management: A series of practices to recognize and understand cultural differences to develop a new culture thereby adjusting to cross-cultural environment.

Culture as Knowledge: The dynamics of cross-cultural perspectives match the concept of knowledge.

Fragmentation: Phenomena of ambiguity, confusion, and contradiction in organization.

Integration: Phenomena of stability, coherence, and consensus in organizations.

Differentiation: Phenomena of inconsistency caused by subcultures in organizations.

Section 3

Social Knowledge Tools, Techniques, and Technologies

Chapter 10

Becoming a Blogger: A Social Knowledge Experiment

Stefania Mariano

New York Institute of Technology, Manama, Kingdom of Bahrain

ABSTRACT

This chapter contributes to social knowledge theory and provides a practical approach for managing social media. This study investigates how knowledge is created, transferred, and shared in social media and proposes a way to manage social knowledge. Qualitative research methods are applied to collect data through in-depth individual semi-structured interviews, think-aloud protocols, focus groups, and document analysis. Data analysis is pursued with the use of the qualitative software package Atlas.ti®. This study contributes to our understanding of how a community of people creates, transfers, and shares knowledge in a virtual social environment, i.e. a Web log. Findings revealed that knowledge transfer was the primary knowledge process in the management of the Web log and highlighted common issues, concerns, and suggestions on how to develop a more effective virtual social environment. Limitations in the creation, transfer, and sharing of knowledge are discussed, and recommendations on how to improve a Web log are provided for practice.

“The outcomes of the blog open a gateway for new venues in my personal knowledge” [Participant 2]

INTRODUCTION

Web logs (or Blogs) are tools to foster collaboration and interactions among users. The first blog appeared on the Internet in 1997 (Lyons, 2005) even though online personal diaries have emerged

on the World Wide Web since 1994 (Sullivan, 2005). Along with MySpace, Facebook, YouTube, Flickr, and Wikipedia, Web logs are considered as the backbone of Web 2.0, a term coined to embody the new Internet advancement where knowledge is socially constructed and distributed. The social construction of knowledge is recognized as a source of competitive advantage by

DOI: 10.4018/978-1-60960-203-1.ch010

many organizations (Davenport & Prusak, 1998; Dixon, 2000). These organizations have started using social media, e.g. wikis for collaboration, and social networking tools for connecting people, to develop flexible and intuitive solutions and facilitate participation and communication. The use of social media has contributed to shift the *need-to-know* organizational paradigm to the *need-to-share* organizational paradigm (Girard, 2010) increasing the importance of a collaborative working environment where individuals feel free to disseminate what they know for the benefit of the organization. Despite this increased interest in the use of social media, however not all organizations have achieved the desired level of knowledge sharing nor have they identified an effective way to manage social knowledge.

The purpose of this study is to provide empirical support for the management of social media. This study explores how a community of people creates, transfers, and shares knowledge in social media, i.e. a Web log which is defined as a site about a person or company that is usually updated daily (Robbins & Judge, 2010). The goal is to develop a conceptual framework on the management of knowledge in social media. Another purpose is to provide evidences about factors influencing the process of knowledge creation, transfer, and sharing in Web logs, and recommendations for the design and implementation of Web logs in organizations. In this study social knowledge is defined as the use of social media to create, transfer, and preserve organizational knowledge with a view to achieving the organizational vision (Girard, 2010). In the following sections, the theoretical basis regarding knowledge management, social media, and social knowledge is presented. Follows a comprehensive description of the qualitative methodology used to collect and analyze data. Findings are shown by means of quotations from interview transcriptions derived from the use of the qualitative software package Atlas.ti®. Theoretical and managerial implications

regarding the results of this study are presented and future research is discussed.

Research Questions

The research questions follow from the purpose of the study. They were designed to provide enough direction without being too restrictive. They are as follows:

1. RQ: How are social media used to manage knowledge?
2. RQa: What are the main impediments to the management of knowledge in social media?
3. RQb: What are the recommendations to the management of knowledge in social media?

RELEVANT LITERATURE AND SIGNIFICANCE OF THE STUDY

Knowledge Management, Social Media, and Social Knowledge

Academic and practitioners have long been considering knowledge creation (Nonaka, 1994), transfer (Van Wijk, Van Den Bosch & Volberda, 2003), and sharing (Hayes & Walsham, 2003) as crucial knowledge management processes for the success of contemporary organizations (Davenport & Prusak, 1998; Dixon, 2000).

Research has extensively investigated the role of individuals (Cook & Brown, 1999) and information technology (Alavi & Tiwana, 2003) in the management of organizational knowledge and has pointed out the formal and informal aspects of the management of knowledge to make individual expertise available to the other members of the organization (Davenport & Prusak, 1998; Snowden, 2003). The attention has been focused on the informal interactions of individuals (Nonaka, 1994), and on the creation of communities of practice (Brown & Duguid, 1991; Hornett & Stein, 2009; Dalkir, Bilodeau, & Wiseman, 2004), or social networks (Cross, Parker, Prusak, &

Borgatti, 2001), and has investigated how knowledge is collectively created and shared by these individuals. A large body of research has explored the role of information technology to facilitate those interactions and to help the implementation of formal procedures of knowledge sharing (Alavi & Tiwana, 2003), especially in large and multi-unit organizations where knowledge can be dispersed (Olivera, 2000). The use of centralized electronic repositories, internal Wikis, and knowledge drives has become a way to increase organizational knowledge and improve the capacity of employees to share their individual expertise. This increased understanding of the critical role of knowledge collectively developed through the use of online information technology tools has motivated the need of further investigations on the role of social media, e.g. wikis for collaboration, and social networking tools for connecting people, to better understand how those tools can be managed to facilitate the creation, transfer, and sharing of social knowledge. Research has highlighted the importance of social media to support the creation, transfer, storage and retrieval of knowledge, the so called *knowledge processes* (Alavi & Tiwana, 2003), to contact a knowledge source (Zack, 1999), or to transfer knowledge from one allocation to another (Alavi & Tiwana, 2003), with periodical updates of the tool by the members of the organization (Orlikowski, 1996) who generally contribute by presenting their own perspectives (Dixon, 2000). To entice the post of individual contributions, research has found that external rewards (Constant, Sproull, & Kiesler, 1996) help appealing employees and has highlighted the unwillingness of individuals to update a shared database in the absence of external rewards (Goodman & Darr, 1996). Finally, a body of research has started investigating the role of Web logs (Blogs) in the creation, transfer, and sharing of knowledge and has pointed out format and structure of a Web log, providing recommendations on blogging (Wyld, 2008),

and contributing to the academic and practitioner debate on social knowledge.

Significance of the Study

Research shows that the study of social knowledge is useful because it clarifies the problem of knowledge transfer (Van Wijk et al., 2003), contributes to a better understanding of the relationship between information technology and individual knowledge (Alavi & Tiwana, 2003), and increases the awareness of stored organizational knowledge (Alavi, 2000; Huber, 1991).

Since the study of social knowledge in social media is an under-researched topic, there are some unanswered questions and information gaps. This study is relevant for both practitioners and academics. Practitioners would be assisted by this research study in the identification of gaps that reduce the sharing of organizational knowledge, especially in large and multi-unit organizations (Olivera, 2000). They would be assisted in reducing cycle time and cost to develop routine solutions (Walsh & Ungson, 1991) and in promoting organizational “best practices” (Szulanski, 1996). This study also provides insights for academics and contributes to the debate on knowledge creation, transfer, and sharing in social media through the collection of empirical data on social knowledge. Such knowledge will be useful to those interested in a new theoretical approach connecting individual knowledge to social knowledge, as well as to those studying social media for the management of organizational knowledge.

METHODOLOGY

This study approaches the research project from a grounded theory perspective and uses qualitative research methods to investigate the creation, transfer, and sharing of knowledge in social media.

Participants of this study are eight graduate students of a School of Management based in the

Kingdom of Bahrain, Middle East. Four participants are female. They represent the ideal sample as at the time of the study they were all attending a graduate course in Knowledge Management and were familiar with knowledge processes, information technology repositories, and managerial concepts. A theoretical sampling strategy was used as participants were chosen “based on their ability to contribute to an evolving theory” (Creswell, 1998, p. 118). They were involved in this social media project from March 2009 through May 2009. The project focused on the concept of knowledge visualization and required each participant to update posts, comment on the other participants’ posts, and manage the Web log. Data are collected through individual interviews as the primary data source (Merriam, 2001), and are triangulated (Creswell, 1998; Stake, 1995) through think-aloud protocols, focus groups (Creswell, 2003), and documents analysis (Creswell, 1998; Merriam, 2001). To minimize potential bias and ensure the validity of the study, member checks, and informant reviews (Creswell, 2003) are also conducted. This study follows ethical policies. Both goals and purposes of the study are explained to participants and information gathered during the study is held confidential. Participants in individual interviews are provided with a copy of the interview transcription and opportunity to comment or modify the transcription is given to them.

DATA COLLECTION AND SOURCES OF DATA

Data were collected from multiple sources and this ensured the trustworthiness of the study (Creswell & Miller, 2000). A questionnaire was submitted to participants after the first week of the project. Questions were formulated to collect the preliminary experience of participants and to point out major constraints and advantages of the use of a Web log. Eight individual interviews and

eight think-aloud protocols were then conducted. Individual interviews lasted an average of 30 minutes and were conducted face-to-face. Followed a 20 minutes think-aloud protocol. Participants were asked to think out loud as they went through the posts on the Web log to probe the opinions expressed during the interview session and to collect their additional feedback and comments. Individual interviews and think-aloud protocols were all recorded and transcribed. Toward the end of the study the interview log (Merriam, 2001) format was used to confirm tentative findings of the study. This interview format was used only in two cases. Individual interviews and think-aloud protocols were completed over a two weeks period. At the end of the study a focus group was organized with all participants. Questions intended to discover the overall experience of participants. Questions were related to knowledge creation and sharing, evolution of the Web log, personal contributions and collective interactions, advantages and disadvantages of the use of a Web log. The two hour focus group session was also recorded. As part of document analysis, data were collected through participants’ personal notes, email correspondence between the researcher and the participants, tracks of online comments and individual contributions, and a PowerPoint document made by all participants containing their own opinions about strengths/weaknesses, areas of improvements and recommendations, and positive aspects of the Web log. Finally, data were collected through informal conversations and small talks held during the project meetings.

DATA ANALYSIS

Data analysis is conducted using research protocols, i.e. contact summary forms, and document summary forms (Miles & Huberman, 1994). The qualitative data analysis software package Atlas.ti® is used to analyze interview transcriptions. The use of Atlas.ti® and the interpretation of

protocols (Miles & Huberman, 1994) provided a means to understand data. Data resulted in aggregations and themes (Miles & Huberman, 1994) and offered insights to understand: (i) the creation, transfer, and sharing of knowledge in a Web log; (ii) impediments to the creation, transfer, and sharing of knowledge in a Web log; and (iii) recommendations on how to manage knowledge in a Web log.

Coding and the Use of Atlas.ti®

Reviewed copies of individual interviews and think-aloud protocol transcriptions were entered into the qualitative data analysis software package Atlas.ti®. A “code-start” list of key words based on research questions, assumptions, interview questions, problem areas and key variables (Miles & Huberman, 1994) was developed. This “code-start” list contained not more than a dozen of codes, as suggested by Miles and Huberman (1994). The coding process pursued the framework of grounded theory (Glaser & Strauss, 1967), and involved a variety of coding techniques available in Atlas.ti®, i.e. open coding, in-vivo coding, code-by-list, and quick coding. As part of data analysis, memos and comments were used to capture reflections and ideas of the researcher and became part of the interpretation process (Creswell, 2003; Miles & Huberman, 1994). A counting analysis (Miles & Huberman, 1994) of the responses was also frequently made to “see what you have” (Miles & Huberman, 1994, p. 253). This collected information was summarized and detailed described and helped the interpretation of findings.

Informant Reviews

Informant reviews (Creswell, 2003) were conducted toward the end of the study to discuss preliminary findings with all participants. A PowerPoint presentation was shown to all participants in a two hours meeting. They were asked to discuss

preliminary findings and provide feedback and comments. This session helped to validate the findings and contributed to the interpretation and data analysis processes. In addition to such a formal review, constant and informal member checks were made during the data collection process.

FINDINGS AND INTERPRETATION

The management of knowledge for these participants consisted of three independent but iterative processes connected to online activities, i.e. knowledge creation, knowledge transfer, and knowledge sharing. Knowledge creation regarded the elaboration of a post; knowledge transfer was facilitated by the use of images and videos, the implementation of formatting styles, the use of labels and tags, and the organization of ex-ante training and ex-post monitoring by a web master; finally, knowledge sharing activities included the use of feedback and comments, and the implementation of chat systems and discussion forums to facilitate the interchange of ideas, thoughts, and individual knowledge. This study found that participants had a general preference to apply pull format while uploading a new post, pulling in an audience, e.g. they would locate a link to an external video into the elaborated post. Oppositely, while retrieving knowledge from someone else’s post, they would prefer the knowledge to be visually represented in a push format, e.g. the video had to be embedded into the post to avoid the connection to an external webpage. To attract the visual attention of users, a post had to be short and simple, elaborated, categorized and summarized by the author for an easy retrieval, regularly updated, and professionally formatted.

In this section findings are presented with respect to the two secondary research questions. They are discussed in separate paragraphs to highlight the main impediments in the use of a Web log, and the participants’ recommendations

on how to improve the effectiveness and efficiency of a Web log.

Research Question A: Impediments to Social Media

When asked to list the primary impediments to the management of the Web log, participants mentioned three main issues that emerged during the development of the project: Lack of time, lack of understanding, and lack of motivation.

Lack of Time

Lack of time was a major barrier in the management of the Web log. Participants claimed to have busy working schedules, restrictions in the access to the Web log from their workplace due to corporate security policies, and complained about the project length which was too short to let them completely get to know the tool.

In general, participants encountered difficulties to coordinate their working schedule with the management of the Web log which in turn led to an approximated selection of contributions to upload. Participants tended to use Internet search engines to find the knowledge to be uploaded, and only in exceptional cases they decided to upload their own notes and elaborations, pictures and draws, new ideas, personal reflections or personal statements:

“The timeframe that I had didn’t allow me to have further time to go and search maybe for a better thing or for a different thing, so it is a general thing that I decided to select and upload” [P1]

This also happened to those participants who had the access to the Web log either at night time or early in the morning before going to work due to Internet restrictions in the workplace. The lack of time at work forced participants to manage the Web log in their own free time overlapping family or private needs. Although the Web log software

was considered as user friendly, the short length of the project imposed participants to selectively use it, avoiding complex features or merely restrict its use to basic features. As a participant claimed:

“I am assuming that a lot of people don’t have time so you are not able to contribute positively as I would assume” [P3]

Along with the approximated selection of contributions, the lack of time also impacted the quality of posts. Some participants did not elaborate their contributions and generated long posts which appeared difficult to be read. This generated information overload and forced the other participants to skip those posts and focus on shorter ones. Long posts were blamed as much as those posts containing only links to external websites without the inclusion of a description of the related content. This problem especially emerged when participants were asked how to improve the Web log. For example, one participant pointed out the following:

“I think again by contributing positively and focusing more on the content...instead of just saying that «this is the video here» because again I think the idea of the blog is to understand what it is in there and if you have more links to the blog I think it becomes time consuming and defaces the purpose of it” [P4]

Lack of Understanding

In the view of the participants of this study, lack of understanding was another major impediment to the management of the Web log. Two main issues emerged: (1) knowledge visualization, the topic of the Web log, was not always discussed in participants’ contributions; and (2) the Web log benefits were not clear at the beginning of the project.

In general, participants expressed a preference to upload posts related to various topics and did not focus on a single topic. The Web log was seen as a place to share opinions and comments related to several topics. From the interview transcriptions, it emerged that participants either expressed a clear preference for multiple topics or pointed out the fact that contributions to the Web log were not always related to knowledge visualization which may be seen as a general attitude of participants to avoid the focus on a single topic. Participants expressed a preference to comment posts related to class discussions to get feedback from the other students. From a more general view point, this may represent an attitude to use social media to debate on topics that may emerge from the workplace on a daily basis instead of focusing on strict and predetermined themes.

When asked the reason why they would select and post a specific contribution, participants claimed they would do it according to their own interest in the specific subject area or for the benefit of the other participants. Only in two cases participants uploaded posts related to their job or to promote their own company. In these cases, the participant's own interest and area of expertise influenced the selection of the topic. In general, this may be seen as a way to show case the talent of participants and contribute to the development of social media with personal tacit knowledge.

Lack of Motivation

From data analysis, it emerged that participants lacked of motivation while contributing to the development of the Web log. When asked why they uploaded a certain post, participants claimed they would do it for personal reasons, i.e. to earn a satisfactory grade in the overall project. They complained about the lack of interactions, comments, and participation from others; they also pointed out the fact that posts were not exactly related to knowledge visualization most of the time, but discussed general knowledge manage-

ment issues which defaced the purpose of the project whose focus was on how knowledge could be effectively visualized.

Research Question B: Recommendations

When asked to provide feedback on when, how, what, and why improve the overall usability of the Web log, participants suggested a broad list of recommendations. They were grouped into two main categories related to the content and the structure of the Web log.

Content

One of the comments raised from the interview transcriptions regarded the length of a post. Participants claimed that long posts were difficult to be read, lacked of clearness, and made the management of the Web log quite complex and inefficient. An ideal post was elaborated in one paragraph with a clear title related to the content and clickable subtitles connected to additional insights to be shown in a cascade format, if opportunistically activated. As a general finding, it emerged that clarity and length of the post appeared to be strongly related.

Another frequent recommendation regarded the use of images and videos. While videos were not always considered as useful because "*I personally don't have time to look at videos*", as a participant claimed, the correct use of images helped the identification of the content of the post, facilitated the navigation of the Web log, and increased the attractiveness of contributions. Images had to relate to the content of the post, and had to have appealing colors with a clear location on the webpage; videos had to be embedded into the post to allow an easy access. As a general preference, participants showed an interest for weekly topics.

The last finding regarded the blogger's identity, which was recommended to be always clearly

Becoming a Blogger

stated at the end of the post, and in the comments section. The Web log was considered as a virtual place to leave and receive feedback, provide further insights, stimulate debate, and propose personal thoughts and experiences related to the virtual discussion. In general, it was found that a general expression of interest was not considered as a useful comment of a post, as a participant clearly stated:

“...what I meant for interactions was more of the participation from the others I don't expect them to write a story but I would expect them to give feedback, feedback like «this is good» is not very appropriated unless if I am asking «what do you think of this?» but usually I think the purpose of the blog is to make people aware of what you are doing in terms of our project so I would like to see people providing feedback or comments as far as if they like something about it, or what is it that they like about, or what is it that they dislike, or what is it that they think should be added or considered” [P4]

Structure

The format of a post and the structure of the Web log were the other two recommendations provided by the participants of this study. The first recommendation related to the length of a post as it was suggested to keep it short and simple to increase the readability of the Web log. To attain this goal, participants suggested creating several sub-paragraphs and link them to clickable subtitles connected to further contents. Such a post organization was considered as the most efficient one to ensure an increased readability of the Web log and an easier access to the relevant content.

To improve the usability of the Web log, it was also suggested to use categories and tags to group articles for future accesses, and to place a bottom at the end of the post to facilitate the retrieval of previous posts. Although the use of labels and

tags was mentioned by several participants and emerged as a common pattern in data analysis, the debate about when the categorization had to be done, i.e. at the beginning of the project or after articles were posted on it, was controversial.

Participants expressed an interest for chat rooms and discussion forums, two features not available on the Web log but considered essential tools to increase interactions, and create a sharing virtual environment where questions could be answered and knowledge could be transmitted from one source to another in real time.

Finally, an emerging pattern regarded the training on how to post a new content. Participants underlined the importance to introduce a trainer or web master to facilitate the application of rules and procedures on how to blog, and how to format contributions, especially in terms of font and template usage. The training was seen as a way to get to know the tool but also to ensure high quality contributions and increase the effectiveness of the Web log:

“If there was more training at the beginning on how to, how to bring an article into the blog, how to post an image, how to post a video, how to post different stuff within the blog, that would help a lot, first of all now you know how to post it, then you have to do research to find the right article” [P7]

SUMMARY

This section summarizes recommendations on how to improve the Web log. It considers both the content and structure, and highlights the expected produced outcome, i.e. knowledge creation, knowledge transfer, or knowledge sharing (Table 1). For a definition of knowledge creation, transfer and sharing please refer to the glossary of key terms in the appendix section of this book.

Table 1. Summary of recommendations

Recommendation	Category	Outcome
Elaboration of a post. Keep it short and simple	Content	Knowledge creation
Use of images and videos	Content	Knowledge transfer
Weekly topics, regular updates	Content	Knowledge transfer
Identity of contributors and use of feedback/comments	Content	Knowledge sharing
Cascade format	Structure	Knowledge transfer
Categorization/use of labels and tags	Structure	Knowledge transfer
Chat system and discussion forum	Structure	Knowledge sharing
Training and web master	Structure	Knowledge transfer

Recommendation 1: *While elaborating a new post it is critical to keep it short and simple.* This first recommendation regards the content of a post. If it is summarized and appropriately elaborated it will contribute to the creation of new knowledge for the benefit of the virtual community. This process is also connected to the amount of bloggers’ interactions and contributions. This process is seen as a way to share basic information that in turn will become social knowledge once it is elaborated and mixed with personal knowledge. As a participant claimed:

“...how did this guy know about storytelling? Because he heard about storytelling from somebody else’s submission, so by starting collecting material he developed new knowledge, based on old knowledge, I mean the previous knowledge that was on the blog, so people are reading, they are interacting, they are adding material related to the subject, so people started throwing information in the beginning of knowledge and they are becoming more focused” [P2]

Recommendation 2: *The use of images and videos will facilitate the location of a post and will increase its attractiveness.* This second recommendation regards the content of the post. The correct use of images and videos will facilitate the understanding of the post, will make it more appealing to readers, and will contribute to the

body of knowledge transferred on the Web log. This will be especially ensured if the image or video is clearly embedded into the Web log.

Recommendation 3: *The Web log should be regularly updated.* The update process has to be done regularly, e.g. daily contributions, and may regard weekly topics. This process will facilitate the transfer of knowledge from one source to another and will create the basis for knowledge sharing through the comment section and chat/forum systems.

Recommendation 4: *The identity of contributors should be always stated and interactions should be ensured through the comment section of the Web log.* Knowledge sharing is an interactive process that may be easily facilitated by the comment section. As a participant claimed:

“It has become a good source of knowledge sharing between the students, and you know, what I have realized we are looking for each others’ comments, so let’s see what happened here, there were comments on this article, there were comments on that, you are waiting even for specific guy’s comments what he has to say about it, you want to hear others’ opinions on that, what is going on, it is a good way to communicate knowledge” [P2]

Recommendation 5: *Labels, tags and active titles should be used to increase the usability of the Web log.* A correct categorization of posts

will facilitate the transfer of knowledge from one allocation to another and will improve the effectiveness of the Web log. It is recommended to make posts short and simple, and use clickable titles connected to further information to be shown in a cascade format if opportunely activated.

Recommendation 6: *Interactions may be facilitated through the use of chat systems and/or discussion forums.* The use of chat rooms and discussion forums will enhance knowledge sharing, and will promote online debates, feedback, and personal reflections.

Recommendation 7: *Training on how to blog and the introduction of a webmaster may increase the quality of contributions.* To facilitate the transfer of knowledge, participants suggested introducing training sessions at the beginning of the development of the Web log, and encouraged the introduction of a webmaster to constantly monitor the Web log to make sure that rules and procedures are applied and the quality of contributions is ensured.

DISCUSSION, LIMITATIONS AND FUTURE RESEARCH

Previous research indicates increased consent over the critical role of management processes in the creation, transfer and sharing of organizational knowledge (Nonaka, 1994; Bennet & Bennet, 2004; Hayes & Walsham, 2003; Davenport & Prusak, 1998; Dixon, 2000).

Researchers' interests have long been concerned with characteristics and mechanisms of management processes and the attention has been focused on five main processes: Acquisition (Shrivastava & Schneider, 1984), retention (Gioia & Poole 1984; Nelson & Winter, 1982; Spender, 1996), and retrieval of knowledge (Huber, 1991; Olivera, 2000; Mariano & Casey, 2007), but also knowledge transfer (Van Wijk et al., 2003), and knowledge sharing (Huber, 1982; Welsh & Dehler, 2004). Since the introduction of the Internet as

a tool to foster interactions and communication processes, individuals have started using social media, e.g. wikis and social networks, to transfer or share their own personal knowledge shifting from traditional emails to centralized repositories, e.g. Web logs. As a result, organizational knowledge has become more easily accessible and searchable, and Web logs have been seen as a more permanent and user-friendly communication media (Wyld, 2008). Web logs have thus become ways to narrate individuals' day-to-day activities and have help individuals corresponding with the other members of a community, e.g. a company (Manjoo, 2002). A Web log is seen as a destination site. On the Web log only wanted communication processes take place by opposite of email inboxes were both wanted and unwanted communication processes, e.g. spam messages, may occur (Wyld, 2008; Weil, 2004). This study was an empirical contribution to the debate on Web logs. It addressed the following research questions: (RQ) How are social media used to manage knowledge? (RQa) What are the main impediments to the management of knowledge in social media? (RQb) What are the recommendations to the management of knowledge in social media?

Purpose of this study was to better understand how individuals create, transfer, and share knowledge in social media.

Findings confirmed those research studies addressing the significance of information technology tools to support the creation, transfer, storage and retrieval of knowledge, the so called "knowledge processes" (Alavi & Tiwana, 2003), and supported the importance of codified processes and interactions of individuals on a Web log. This qualitative study found that participants generally transferred or shared knowledge on the Web log and only in some cases they contributed to the creation of new knowledge. Knowledge creation included all activities related to the elaboration of a post; knowledge transfer included activities related to the structure of a post, and to the training and monitoring activities; finally, knowledge

sharing activities included the use of systems to facilitate the interchange of ideas, thoughts, and personal knowledge on the Web log. It was found that the Web log was periodically updated by individuals (Orlikowski, 1996), confirming that less than two to three posts per week would not give individuals a reason to visit the Web log (Wyld, 2008). This study found that while updating new posts, participants usually used a pull format, e.g. they would include a link to an external video into the post, even though they preferred to retrieve knowledge from someone else's post that used a push format, e.g. the video was embedded into the post. To attract the visual attention of users, a post had to be short and simple, elaborated and summarized by the author – “you must be the author of your posts” (Wyld, 2008, p. 465) – categorized in terms of a certain content for an easier retrieval, e.g. “permalinks that other bloggers can use to link back to a specific post on your blog, not simply to the front page” (Wyld, 2008, p. 461), regularly updated, and professionally formatted. These findings confirmed Wyld's (2008) recommendations regarding basic strategic decisions to make about the format and structure of the blog, e.g. name, screen layout, archiving options. Participants expressed a preference to comment posts related to class discussions to get feedback from the other students; from a more general view point, this may represent an attitude to use social media to debate on topics that may emerge from the workplace on a daily basis instead of focusing on strict and predetermined themes. Also, these findings confirm the importance of the comment section as it provides “the opportunity for readers to provide feedback to the blogger” (Wyld, 2008, p. 461). Participants claimed that the use of instant message systems was not allowed and such a limitation influenced their ways to contact a knowledge source, (Zack, 1999) or to transfer knowledge from one allocation to another (Alavi & Tiwana, 2003). The absence of training programs to help participants getting used to the Web log software affected the motivation to use

complex features of it or to post notes/replies to it (Orlikowski, 1993).

Findings addressed several impediments in the use of the Web log. Participants cited the lack of time, lack of understanding, and lack of motivation to use and update the Web log. It turned out that participants liked to answer posted questions to help each others despite the absence of external rewards (Constant et al., 1996), which in this study was represented by the course grade. This result confirmed Goodman and Darr's (1996) study which found that in the absence of external rewards employees are not motivated to update shared databases.

This study has implications for practice. Managers, who want to use a Web log to increase the creation, transfer and sharing of knowledge within a company, will have to schedule daily time to allow employees to manage and update it. For instances, this may be half an hour at the end of the work day. It will avoid complains about the lack of time and will motivate individuals to develop the Web log. An increased motivation to contribute to the Web log may also come from the implementation of a ranking system, e.g. polling or power ranking (Wyld, 2008) of the best post or best blogger, e.g. post/blogger of the month. Blogger will be allowed to discuss topics that may emerge from the workplace instead of focusing on strict and predetermined themes. Blogger will also have to be trained about the features of the software to avoid the lack of understanding in the use of the tool. Chat systems, discussion forums, clickable titles connected to extra content, and permalinks will have to be implemented to improve the usability of the Web log.

This study also provides insights for academics and contributes to the debate on how knowledge processes can be related to social media throughout the collection of empirical data on social knowledge. This will be useful to those interested in a new theoretical approach connecting individual knowledge to social knowledge, as well as to

those studying social media for the management of organizational knowledge.

This study focuses on the processes of knowledge creation, transfer, and sharing in social media, i.e. Web logs. It does not consider other related knowledge management processes such as acquisition (Shrivastava & Schneider, 1984), and retention of knowledge (Feldman, 1989; Gioia & Poole 1984; Nelson & Winter, 1982; Spender, 1996). This qualitative study focuses only on a small community of individuals.

Future research should be conducted on how Web logs may impact the effectiveness of organizational communications. How do employees make use of the Web log to increase the organizational communication? What type of knowledge is shared? How can organizational communications be improved through the use of Web logs? Empirical research should also be conducted to explain how internal and external bloggers contribute to the development of organizational expertise and how Web log best practices – whose evolution is expected to happen over time (Payne, 2003) – can be produced and managed to create, transfer, and share new knowledge that is introduced into a company throughout organizational social processes.

REFERENCES

- Alavi, M. (2000). Managing organizational knowledge. In Zmud, R. W. (Ed.), *Framing the domains of IT management* (pp. 15–28). Cincinnati, OH: Pinnaflex Educational Resources.
- Alavi, M., & Tiwana, A. (2003). Knowledge management: The information technology dimension. In Easterby-Smith, M., & Lyles, M. A. (Eds.), *Handbook of organizational learning and knowledge management* (pp. 104–121). Malden, MA: Blackwell Publishing Ltd.
- Bennet, D., & Bennet, A. (2003). The rise of the knowledge organization. In Holsapple, C. W. (Ed.), *Handbook on Knowledge Management 1: Knowledge Matters* (pp. 6–20). Berlin, Heidelberg, New York: Springer-Verlag.
- Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science*, 2(1), 40–57. doi:10.1287/orsc.2.1.40
- Constant, D., Sproull, L., & Kiesler, S. (1996). The kindness of strangers: The usefulness of weak ties for technical advice. *Organization Science*, 7(2), 119–135. doi:10.1287/orsc.7.2.119
- Cook, S. D. N., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science*, 10(4), 381–400. doi:10.1287/orsc.10.4.381
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2003). *Research design. Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124–130. doi:10.1207/s15430421tip3903_2
- Cross, R., Parker, A., Prusak, L., & Borgatti, S. (2001). Knowing what we know: Supporting knowledge creation and sharing in social networks. *Organizational Dynamics*, 30(2), 100–120. doi:10.1016/S0090-2616(01)00046-8
- Dalkir, K., Bilodeau, E., & Wiseman, E. (2004). The value of networks. *International Journal of Knowledge. Culture and Change Management*, 4, 993–1000.

- Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.
- Dixon, N. (2000). *Common knowledge: How companies thrive by sharing what they know*. Boston: Harvard Business School Press.
- Feldman, M. (1989). *Order without design: Information production and policy making*. Stanford, CA: Stanford University Press.
- Gioia, D. A., & Poole, P. P. (1984). Script in organizational behavior. *Academy of Management Review*, 9(3), 449–459. doi:10.2307/258285
- Girard, J. P. (2010). Toward an Understanding of Social Knowledge. In Girard, J., & Girard, J. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Goodman, P. S., & Darr, E. D. (1996). Computer-aided systems for organizational learning. In Cooper, C. L., & Rousseau, D. M. (Eds.), *Trends in Organizational Behavior* (pp. 81–97). New York: John Wiley.
- Hayes, N., & Walsham, G. (2003). Knowledge sharing and ICTs: A relational perspective. In Easterby-Smith, M., & Lyles, M. A. (Eds.), *Handbook of organizational learning and knowledge management* (pp. 54–77). Malden, MA: Blackwell Publishing Ltd.
- Hornett, A., & Stein, E. W. (2009). Advances in knowledge management: Mapping ideas that shape practice. In Jennex, M. E. (Ed.), *Knowledge management, organizational memory and transfer behavior: Global approaches and advancements* (pp. 43–60). Hershey, PA: IGI Global.
- Huber, G. P. (1982). Organizational information systems: Determinants of their performance and behavior. *Management Science*, 28(2), 138–155. doi:10.1287/mnsc.28.2.138
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1), 88–115. doi:10.1287/orsc.2.1.88
- Lyons, D. (2005). Attack of the blogs. *Forbes*, 14 November. Retrieved June 12, 2009, from <http://www.forbes.com/home/forbes/2005/1114/128.html>
- Manjoo, F. (2002). Flash: Blogging goes corporate. *Wired*, 9 May. Retrieved July 8, 2009, from <http://www.wired.com/news/culture/0,1284,52380,00.html>
- Mariano, S., & Casey, A. (2007). The individual process of knowledge retrieval: A case study of an American high-technology research, engineering and consulting company. *VINE: The Journal of Information and Knowledge Management Systems*, 37(3), 314–330.
- Merriam, S. B. (2001). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: A sourcebook of new methods* (2nd ed.). Newbury Park, CA: Sage.
- Nelson, R., & Winter, S. (1982). *An evolutionary theory of economic change*. Cambridge, MA: The Bellhop Press of Harvard University Press.
- Nonaka, I. (1994). A dynamic theory of the organizational knowledge creation. *Organization Science*, 5(1), 14–37. doi:10.1287/orsc.5.1.14
- Olivera, F. (2000). Memory systems in organizations: An empirical investigation of mechanisms for knowledge collection, storage and access. *Journal of Management Studies*, 37(6), 811–832. doi:10.1111/1467-6486.00205

Orlikowski, W. J. (1993). Learning from notes: Organizational issues in groupware implementation. *The Information Society*, 9(3), 237–250. doi:10.1080/01972243.1993.9960143

Orlikowski, W. J. (1996). Improving organizational transformation over time: A situated change perspective. *Information Systems Research*, 7(1), 63–92. doi:10.1287/isre.7.1.63

Payne, B. (2003). Blog for business: Is it right for your company? *Marketingprofs.com*, 14 October. Retrieved July 8, 2009, from <https://www.marketingprofs.com/3/payne2.asp>

Robbins, S. P., & Judge, T. A. (2010). *Essentials of organizational behavior*. Upper Saddle River, NJ: Prentice Hall.

Shrivastava, P., & Schneider, S. (1984). Organizational frames of references. *Human Relations*, 37(10), 795–809. doi:10.1177/001872678403701002

Snowden, D. (2003). The knowledge you need, right when you need it. *Knowledge Management Review*, 5(6), 24–27.

Spender, J. C. (1996). Organizational knowledge, learning and memory: Three concepts in search of a theory. *Journal of Organizational Change*, 9(1), 63–78. doi:10.1108/09534819610156813

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Sullivan, A. (2005). The blogging revolution: weblogs are to words what Napster was to music. *Wired* 10, May 2002. Retrieved July 12, 2009, from <http://www.wired.com/wired/archive/10.05/mustread.html?pg=2>

Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17(Winter Special Issue), 27–43.

Van Wijk, R., Van Den Bosch, F. A. J., & Volberda, H. W. (2003). Knowledge and networks. In Easterby-Smith, M., & Lyles, M. A. (Eds.), *Handbook of organizational learning and knowledge management* (pp. 428–453). Malden, MA: Blackwell Publishing Ltd.

Walsh, J. A., & Ungson, G. A. (1991). Organizational memory. *Academy of Management Review*, 16(1), 57–91. doi:10.2307/258607

Weil, D. (2004). Three reasons to publish an e-newsletter AND a blog. *Marketingprofs.com*, 13 April. Retrieved July 12, 2009, from <http://www.marketingprofs.com/4/weil11.asp>

Welsh, M. A., & Dehler, G. (2004). P(l)aying attention: Communities of practice and organized reflection. In Reynolds, M., & Vince, R. (Eds.), *Organizing Reflection*. Aldershot, UK: Ashgate.

Wyld, D. C. (2008). Management 2.0: A primer on blogging for executives. *Management Research News*, 31(6), 448–483. doi:10.1108/01409170810876044

Zack, M. H. (1999). Managing codified knowledge. *Sloan Management Review*, 40(4), 45–58.

ADDITIONAL READING

Cook, S. D. N., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science*, 10(4), 381–400. doi:10.1287/orsc.10.4.381

This paper discusses the relationship between knowledge and knowing. It asserts that knowledge is a tool of knowing, and knowing is an aspect of individuals' interactions with the social and physical world. The interplay of knowledge and knowing generates new knowledge and becomes a source of organizational innovation.

Creswell, J. W. (2003). *Research design. Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.

John W. Creswell identifies and describes the major design characteristics of qualitative, quantitative, and mixed methods. The book is divided in two parts. The first part discusses the framework for design, review of the literature, writing strategies, and ethical considerations. The second part deals with the research design and discusses introduction, purpose statement, research questions and hypotheses, use of theory, definitions, limitations and significance, quantitative methods, qualitative procedures, and mixed methods procedures. This book represents a key reference for students and researchers.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.

This book builds on more than thirty knowledge management initiatives and provides information on the role of information technology in knowledge management, corporate culture, employee behavior, and measurements of a project's success. It represents a practical approach to the study of organizational knowledge.

Nonaka, I. (1994). A dynamic theory of the organizational knowledge creation. *Organization Science*, 5(1), 14–37. doi:10.1287/orsc.5.1.14

This paper provides a conceptual framework on knowledge creation. It examines the dynamic relationship between tacit and explicit knowledge and discusses the four modes of knowledge creation, i.e. socialization, externalization, internalization, combination. It argues that both individuals and organizations play a critical role in the creation of new knowledge.

KEY TERMS AND DEFINITIONS

Knowledge Creation: It regards the formation of new knowledge from previous existing knowledge. It takes place through the interaction between tacit and explicit knowledge.

Knowledge Sharing: It is the exchange of knowledge between two (or more) sources of knowledge.

Knowledge Transfer: It is the transfer of knowledge from one source to another.

Pull Technology: The user has to take actions to retrieve the information, e.g. search engines.

Push Technology: Information is placed in a way to facilitate its view and retrieval, e.g. pushing computer updates to a user.

Web Log: It is an online journal about an individual or a community of people, e.g. a company, with periodical chronological entries.

Chapter 11

Encouraging Participation in Virtual Communities of Practice within the United States Air Force

Nick Bowersox
TUI University, USA

ABSTRACT

With the growth of information and communication technology (ICT) such as the internet, email, and video conferencing, the United States Air Force has become more efficient and productive in conducting its daily business. However, not only do computer technologies increase daily productivity rates among the employees; they also increase the Air Force's capability to digest larger amounts of information while supporting an end goal of being able to share that information across the entire organization. Perhaps one of the most popular methods by which to share such large amounts of organizational information is through informal learning environments such as communities of practice. The Air Force has no doubt embraced the concept of communities of practice. However, as popular as these "communities" are among many employees, there is still a majority of Air Force employees who choose not to use them. The purpose of this chapter is to provide practical ways in which the United States Air Force can increase participation in Virtual Communities of Practice (VCoPs) among its workforce, as well as providing theoretical frameworks upon which further research can be conducted. Finally, this chapter will propose a set of testable propositions that may serve as the basis for future research.

INTRODUCTION

With the growth of information and communication technology (ICT) such as the internet, email,

and video conferencing, the United States Air Force has become more efficient and productive in conducting its daily business. However, not only do computer technologies increase daily productivity rates among the employees; they also

DOI: 10.4018/978-1-60960-203-1.ch011

increase the Air Force's capability to digest larger amounts of information while supporting an end goal of being able to share that information across the entire organization. As such, terms such as knowledge management, knowledge society, and the information age have become dominant themes within the Air Force. Because of this, it may come as no surprise that there is an increasing desire to emphasize knowledge sharing techniques and strategies that will foster improved performance and effectiveness. The emphasis on knowledge management through collaborative means is an excellent manner in which to achieve this (E. C. Wenger & Snyder, 2000). Perhaps one of the most popular methods by which to share such large amounts of organizational information is through informal learning environments such as communities of practice. The Air Force has no doubt embraced the concept of communities of practice. However, as popular as these "communities" are among many employees, there is still a majority of Air Force employees who choose not to use them. The purpose of this chapter is to provide practical ways in which the United States Air Force can increase participation in Virtual Communities of Practice (VCoPs) among its workforce, as well as providing theoretical frameworks upon which further research can be conducted.

COMMUNITIES OF PRACTICE (COPS) DEFINED

Communities of practice (abbreviated as CoPs hereafter) are defined in the early works of Lave and Wenger (1991, p.98) as "a set of relations among persons, activity and world, over time and in relation with other tangential and overlapping communities of practice". This definition centered on the idea of apprenticeship in which CoPs were viewed as a form of socialization into a community (Kimble & Hildreth, 2005). This assumes a unidirectional process by which newer community members integrate themselves

into the community's practices. Lave and Wenger (1991) state that newcomers move from a state of "legitimate peripheral participation" into that of "full membership". During legitimate peripheral participation, newcomers engage in several roles at the same time to invoke varied degrees of experience and interaction. Eventually, members of the community become recognized as they learn the rules and boundaries which guide that community.

Although this definition of CoPs is accurate, perhaps a more modernized and simplified definition is provided by Kimble & Hildreth (2005). They define CoPs as "groups of people bound together by a *common purpose* and an *internal motivation*", often with long-term objectives in mind. Consider this definition in the organizational context. Applying the keywords of the definition provided by Kimble & Hildreth (2005), it can be assumed that the various departments of any organization comprise a CoP (i.e. human resources, finance, and marketing). For example, let's consider an example such as the finance department at a major Air Force base. Each employee working in finance has a common purpose: to successfully control, monitor, and manage the financial assets of the government. Some employees may serve as financial analysts looking at financial statements while others may be in charge of long-term budget forecasting, but in essence their purpose is one in the same. In addition, they are internally motivated to do the best they can to ensure that the United States Air Force continues to have success for many years into the future. As a result of this example, it can be assumed that the practice and purpose of CoPs may be construed as having always existed, even before being formally identified as such.

THE HISTORY OF COPS AND THE SOCIAL LEARNING THEORY

The early work of the social learning theory was attributed to Bandura (1977). In general, social

learning theory emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others. According to Bandura (1977), learning would be exceedingly difficult and hazardous if people had to rely solely on the effects of their own actions to inform them what to do. Through socialized learning, employees of a company are able to share information and knowledge in an effective manner. Learning that takes place in a CoP is viewed as a social process by which members become active participants in the community they are part of.

Etienne Wenger is perhaps one of the most prominent theorists in linking social learning theory to CoPs. Although his theory does not seek to replace existing theories such as Bandura (1977), it does come with its own set of assumptions and its focus. In his book titled *Communities of Practice: Learning, Meaning, and Identity*, Wenger (1998) outlines four reasons as to why learning should be social, rather than individual in nature:

1. We are social beings.
2. With respect to valued enterprises, knowledge is a matter of competence.
3. Knowing is a matter of participating in the pursuit of such enterprises. We should actively engage in the world.
4. Our ability to experience the world and engage with it as meaningful is ultimately what learning is about.

An examination of the four premises above can allow one to conclude that learning is not so much individual as it is an individual acting as a participant in a social community.

Wenger's primary focus of his social theory is that social learning should be viewed as social participation where participation "refers not just to the local events of engagement in certain activities with certain people, but to a more encompassing process of active participants in the practices of social communities" (1999, p. 31). Wenger

(1998) also discusses four components necessary to surmise that social participation is a process of learning. They are:

1. **Meaning:** a way of talking about how individuals experience the world around them through their individual and collective abilities
2. **Practice:** a way of talking about shared historical and social frameworks, resources, and perspectives that can sustain mutual engagement in action
3. **Community:** a way of talking about the social configurations that our enterprises are designed in
4. **Identity:** a way of talking about how learning changes who we are in communities

Figure 1 represents a visual model of Wenger's (1998) components of the social theory of learning. The four elements – meaning, practice, community, and identity – are interchangeable in regards to their relationship to learning. For example, switching any of the elements with learning still allows the figure to make sense.

Much of the scholarly research work conducted on CoPs is based on Wenger's social theory of learning. For example, Kimble & Hildreth (2005) explored the relationship between knowledge management and CoP's using data collected from a case study on a large international corporation. Specifically, the article discusses how the social relationships and shared artifacts inherent to the company's virtual communities of practice (VCoPs) can be linked to Wenger's concepts of a participation-reification duality. Their case study found that shared artifacts were important in the process of creating, sharing, and transferring knowledge through the VCoP as well as facilitating social participation, which is important in building and maintaining personal relationships between VCoP group members.

Ardichvili, Page & Wentling (2003) conducted a qualitative study of the motivators and barriers

Figure 1. Components of the social theory of learning: an initial inventory (adapted from Wenger, 1998, p.5)



to participation in VCoPs. They argue that active participation is a critical ingredient to the successful functioning of any type of CoP. Further, they describe CoP participation as an economic model of supply and demand. In other words, the supply of knowledge provided by the knowledge givers must be sufficient to meet the demand for the knowledge seekers. Therefore, social participation is critical. Overall, the results of their study found that knowledge flows easily when employees view knowledge as a public good that benefits the entire organization. Finally, employees will participate more when they are geographically dispersed and are trying to integrate themselves more quickly into their work environment.

DETERMINING CHARACTERISTICS OF CoPs

According to Wenger (1998), CoPs can be characterized using two broad categories: *structural characteristics* and *dimensions of practice*. *Structural characteristics* attempt to define how CoPs are established, whereas *dimensions of practice* explain how members join CoPs. Both types are equally important in defining, managing, and cultivating CoPs, and, as such, are described in greater detail below.

There has been much research work focusing on identifying CoP structural characteristics.

Wenger (2004) defines the three elements of a CoP as the *domain*, *community*, and *practice*. He defines *domain* as “the area of knowledge that brings the community together, gives it identity, and defines the key issues that members need to address” (p.4). Further, the domain of a CoP helps to recognize the “area” of knowledge to be studied, rather than identifying tasks to be accomplished. The goal in developing the domain is to take the strategy of the organization and develop it into a set of domains of knowledge which should then be able to connect the strategy to the daily work.

Wenger (2004) describes the *community* as “the group of people for whom the domain is relevant, the quality of the relationships among members, and the definition of the boundary between the inside and the outside” (p. 4). This community is more than a group of people sharing similar interests. Rather, it is a group of people fostering high levels of interaction in an attempt to discover new knowledge, transfer existing knowledge, and solve problems. This structural characteristic occurs after the knowledge domains are present. It is here that community members are recruited and those with greater experience may take the lead in further developing and growing the community.

The third element as defined by Wenger (2004) is *practice* which is “the body of knowledge, methods, tools, stories, cases, and documents which members share and develop together” (p.4). Practice takes place after the domains of knowl-

edge and community members are established. It is here that community members are engaged in the development of their practice through various means which may include community speakers and community meetings. This structural characteristic involves finding ways to maximize the amount of knowledge available through efficient use of the resources at hand.

The combination of these three elements enables CoPs to effectively manage their knowledge. According to Wenger (1998), domain provides a common focus, community builds relationships that enable collective learning, and practice anchors the learning in what people do. Because CoPs are organized into domains of knowledge catered to specific members that practice within them, they are well-positioned to add sustainable strategic value to the organization. Figure 2 depicts how knowledge management is a strategic activity that starts with a strategy and ends with a strategy. Strategy is connected to performance through knowledge.

Aside from the structural characteristics of CoPs, it is also important to mention the *dimensions of practice*. Wenger (1998) states that there

are three components of practice for a CoP: *mutual engagement*, *joint enterprise*, and *shared repertoire*. *Mutual engagement* refers to the notion that practitioners with the same interests and ideas will typically be members of the same CoPs. *Joint enterprise* reflects the notion that beyond stated goals there is mutual accountability among community members. Finally, *shared repertoire* includes routines, methods, tools, stories, gestures, symbols, and other such actions and objects that the community has developed over time. Figure 3 addresses the evolution of the CoP, beginning with its structural characteristics that lead to its conception and then its dimensions of practice leading to its growth in community members.

By examining the above figure, reconsider the Microsoft Corporation finance example described earlier. Each employee working in finance for the Microsoft Corporation has a common purpose or domain: to successfully control, monitor, and manage the financial assets of the company. As such, they form a community of employees that collectively work together each day to ensure the financial success of the organization. Thus, social interaction among one another is common, promoting a team-oriented learning environment.

Figure 2. The doughnut model of knowledge management (adapted from Wenger, 2004, p.3)

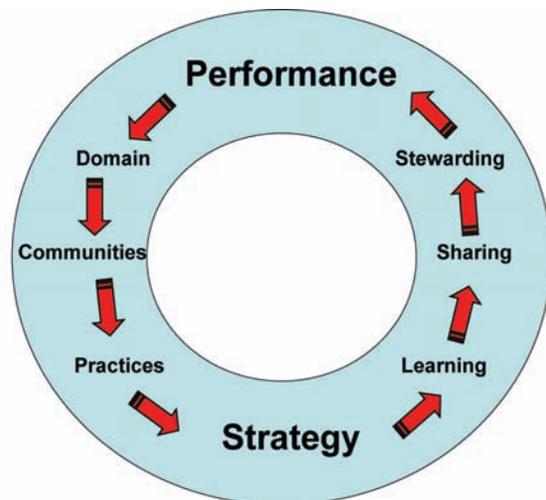
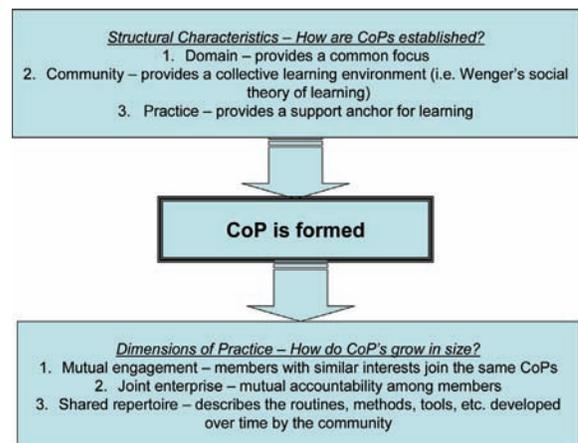


Figure 3. The evolution of the CoP: from conception to the growth of community members (adapted from Wenger, 1998)



Practice, or the knowledge, methods, tools, stories, cases, and documents within the community provides an anchor for collective learning to occur. Since domain, community, and practice are present, the right environment exists for a CoP to form. As the Microsoft Corporation grows over time, new finance employees enter the department. Because they share the same interests towards corporate finance and are committed to the financial success of the corporation as the employees who have been around for some time, they become part of the CoP. Over time, they integrate themselves into the collective network of community members, while at the same time learning the routines, policies, and practices that comprise the community they are a part of.

THE RISE OF VIRTUAL COMMUNITIES OF PRACTICE (VCoPs)

Technological advancements are undoubtedly allowing employees geographically separated from one another the opportunity to become part of a community within the organization. These communities are known as virtual communities of practice and have become popular with the onset of the global information age. As defined by Allen, Ure, & Evans (2003), VCoPs are

physically distributed groups of individuals who participate in activities, share knowledge and expertise, and function as an interdependent network over an extended period of time, using various technological means to communicate with one another; with the shared goal of furthering their practice or doing their work better (p.7).

VCoPs are essentially the same as CoPs. However, members use technologies such as the internet, email, and videoconferencing, to maintain “virtual contact” with one another, whereas traditional CoPs employ face-to-face methods for

member communication. Members of a VCoP can interact through on-line message boards where members view and post messages to one another. Commonly, communication occurs via computer-mediated means; however, other methods such as telephone can occur.

It is no surprise to both scholars and practitioners that knowledge sharing is an innovative force that can lead to long-term competitive advantages for organizations wishing to embrace it. Connelly & Kelloway (2003) define knowledge sharing as a set of behaviors that aids in the exchange of information to others. In today’s global business economy, interpersonal means of communication are becoming rare. Instead, virtual environments are becoming the cost-effective and time-sensitive norm to knowledge sharing for several reasons.

One of the central reasons why VCoPs are important is that they have the potential ability to transfer an organization’s tacit knowledge – the source of its competitive advantages (Dougherty, 1995). Tacit knowledge is that knowledge that is often based on years of experience and is not easily codifiable into a useable form. Horvath (1999) states that tacit knowledge is often buried within the stories people tell and that VCoPs are an excellent means by which to share this tacit knowledge. VCoPs allow employees to communicate anytime and anywhere through virtual telecommunications.

VIRTUAL COMMUNITIES OF PRACTICE IN THE AIR FORCE

The Department of Defense (DoD) has long strived to successfully integrate information sharing among the different branches of the military (Air Force, Army, Navy, and Marines) and has identified knowledge as a key enabler required for this integration to occur. DoD’s goal is for these branches to have the technical ability and necessary relationships in place to share knowledge among decision-makers (DoD, 2005b). Paragraph 4.E.1.,

titled Knowledge Empowered, of the *Capstone Concept for Joint Operations* (DoD, 2005a) states:

The future joint force will emphasize better decisions made faster throughout all levels of command. The fundamentals of this knowledge empowerment are experienced and empowered decision makers benefitting from an enhanced understanding of the environment, potential adversaries and cultures, as well as enhanced collaborative decision-making processes. Although we will never eliminate the fog of war, an increased level of understanding should empower leaders through the joint force. This will enable them to anticipate the act as opportunities are present, apply innovative solutions, mitigate risk, and increase the pace, coherence, and effectiveness of operations even in complex environments. A knowledge-empowered force, capable of effective information sharing across all agencies and partners, will be able to make better decisions quicker, increasing joint force effectiveness. (p. 21)

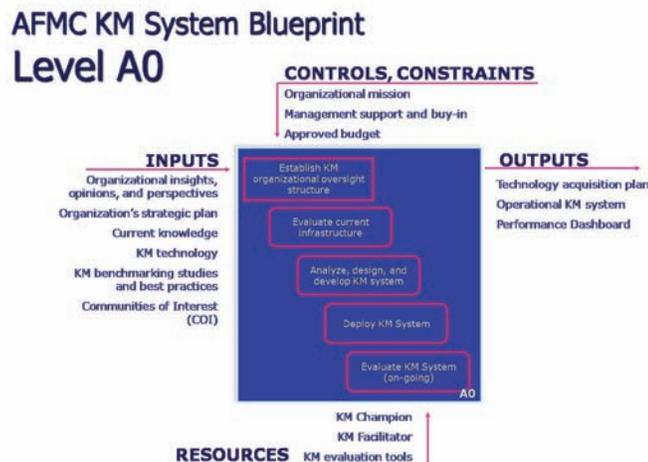
Because of this, the DoD realizes the importance of knowledge management, or KM, across all services. In fact, it is mentioned that knowledge is critical for making decisions faster and better

than the enemy, and for sustaining that knowledge as a tactical advantage (DoD, 2007).

USAF, one of the DoD services, is an organization faced with an increasing workload, diminishing manpower, and an ever-increasing necessity to maximize efficiencies. As such, USAF has embraced the concepts of KM to manage this heavy workload. “Precision is one of the fundamental requirements that underpin the effectiveness of air and space power. To be precise in the application of force requires knowledge” (USAF, 2003). The *Air Force Information Strategy* (USAF, 2002) identifies that one of its main goals is to implement and support KM techniques and strategies that help to create, share, and transfer organizational knowledge. Further, it states that “knowledge management practices are an essential element to the overall information strategy for the Air Force” (USAF, 2003).

In accordance with its information strategy, the Air Force created the Air Force Center of Excellence for Knowledge Management (AFKN) in 2004, whose primary purpose is two-fold. First, the center is to create, maintain, and develop the AFKN website, which allows users (Air Force personnel, both military and civilian) access to a central site where they can share information

Figure 4. AFKN’s Five Level Methodology



with one another. Secondly, the center carries out workshops to various organizations within the Air Force. These workshops aim to provide KM education and technology, as well as change management techniques, to those organizations requesting assistance. Figure 4 is a graphic representation of AKFN’s five level methodology used in daily operations.

The AFKN website provides an array of information as well as tools used to aid in the process of collaborating and sharing knowledge. Some of these tools include Knowledge Discovery, Air Force Deskbook, Virtual Communities of Practice (VCoPs), and Wisdom Exchange (Table 1).

Because the Air Force wants to capitalize on the benefits of positive KM business practices, AFKN is able to measure its usage among customers in the form of metrics using trend analysis and statistical techniques. It is important to mention that AFKN user accounts have grown from 400 in 2002 to 333,000 in 2009. Further, the number of VCoPs has grown from 100 in 2002 to 4,600 in 2006 to 13,000 in 2008. Employees are highly encouraged by Air Force leadership to become active members of multiple communities of practice and other relevant KM communities. Air Force leadership encourages workers to acquire, create, document, transfer, and apply new knowledge whenever possible. However, there are still many employees who choose not to use these amazing knowledge sharing tools. How can the Air Force change this? The following sections try

to answer this question using previous theoretical research.

PARTICIPATION IN VIRTUAL COMMUNITIES OF PRACTICE

According to Ardichvili, Page & Wentling (2003), “one of the critical factors in determining a virtual community’s success is its members’ motivation to actively participate in community knowledge generation and sharing activities” (p. 64). Many studies, such as those of Connelly & Kelloway (2003), suggest the importance of a work environment that stresses positive social interaction and knowledge sharing. Organizations like this give rise to employees who are knowledgeable about company rules, regulations, and procedures. Further, these types of employees better understand and trust their co-workers, and are more willing to work with them on team projects. Still other studies (Ciborra & Patriota, 1998) show that employees are unwilling to share knowledge and participate in positive social interaction cultures. Holthouse (1998) instead argues that the successful (or unsuccessful) transfer of knowledge is a by-product of the organization’s knowledge management system. Amidst all of this confusion, though, there is little substantiating evidence to support why employees of an organization choose to participate in VCoPs. The paragraphs that follow will attempt to shed some light on this subject.

Table 1. Summary of AFKN knowledge tools

AFKN Tool	Definition/Purpose
Knowledge Discovery	Search engine allowing users to locate information across various Air Force websites
Air Force Deskbook	Handy reference guide providing acronyms, common practices, reference, website links, and lessons learned
Virtual Communities of Practice (CoPs)	Virtual workspace allowing members to share information with one another.
Wisdom Exchange	Allows users to post questions on a bulletin board which are then answered by subject matter experts (SME’s)

For a VCoP to have activity, it is critical that all members take an initiative in participation. These two words – activity and participation – are important and deserve further explanation. Koh, Kim, Butler, & Bock (2007) delineate activity in a VCoP as *posting activity* and *viewing activity* which may be done through various means to include live audio/video streaming, message boards, and online chats. Activity such as this is a necessary and critical component to any VCoP. Participation is a two-fold definition and entails that members be willing to **both share** and **use** existing knowledge. Therefore, when members *share* their knowledge, they are participating in *posting activity*; when they *use* knowledge that is available on the VCoP, they are participating in *viewing activity*. But what exactly is meant by sharing and using knowledge? Simply put, sharing knowledge implies that the “owner” of the knowledge is willing to allow others to use it. Knowledge sharing can be defined as the activities that involve gathering, absorbing, and/or transferring product and/or service information between organizations and customers, alliance partners, and/or employees (Chen & Barnes, 2006). Those using the knowledge will gain increased levels of understanding and efficiency into the business policies, practices, processes and procedures, thereby allowing them to better contribute to the firm achieving its competitive advantages in the marketplace.

Active participation helps to maintain the socio-technical nature of this online environment (Koh, et al., 2007). Ardichvili, Page, & Wentling (2003) link employee participation in VCoPs around three central themes which are discussed below.

1. *Employees must willingly participate to share knowledge* – The first reason why employees participate in VCoPs is to share knowledge. Many employees often feel a desire and passion to educate others and give back to the company. Further, these types of

employees disregard information hoarding as an obsolete technique for corporate success. Essentially, these types of employees are adding to the supply of knowledge in VCoPs.

2. *Employees must willingly participate to use knowledge* – If employees are willing to share knowledge, then it only makes sense that other employees are willing to use that knowledge. One of the primary reasons for the existence of VCoPs is to help disseminate knowledge across the organization. Today’s competitive marketplace has forced a strong demand on the use of both new and existing knowledge.
3. *Employees must willingly participate to use technology* – In order to effectively use the full functions of the VCoP, employees must be willing to use the technology that comprises it. For a virtual community, members should feel comfortable in using a computer, the internet, and various other web-based technologies. Technology acts as a necessary facilitator to the flow of knowledge.

MOTIVATORS TO SUCCESSFUL VCoPs

The success of VCoPs is undoubtedly based on several factors. Just as in traditional CoPs, participation by employees is a necessary factor. Participation is necessary to create a social learning environment where the sharing of knowledge can occur. Thus, social participation is a process of learning (Wenger, 1998). Studies have yielded many similar success factors to participation which we will term “motivators”. Koh et al. (2007) proposes 4 motivators for successful VCoPs: leader involvement, offline interaction, usefulness, and the IT infrastructure quality. This chapter proposes to add a fifth motivator: online interaction. Each of these are discussed in greater detail below.

The first motivator is *leader involvement*. Leader involvement is perhaps the most important factor that encourages employees' use in VCoPs. When leaders stay involved, employees are more willing to take an active role in posting and viewing comments. In other words, they are more willing to share and use the knowledge provided by the VCoP. This is supported by Allen et al. (2003) who states that "active participation in communities by upper-management clearly indicates that the organization has made a commitment to VCoPs and serves to motivate others to participate" (p. 37). Further, leaders must show involvement by providing the overall guidance and support that will build, maintain, and grow the community (Fontaine, 2001). Finally, Koh et al. (2007) states that leadership involvement is necessary to promote trust among community members.

Offline interaction, such as face-to-face interviews, is another equally important element of VCoPs. Although collaboration in a VCoP is often done via computer-mediated technology in an online environment, offline interaction among community members helps to establish working bonds, trust, and communication skills that may otherwise be difficult to obtain. Due to physical separation, offline communication may not always be possible. It should, however, be maximized whenever possible.

The perceived *usefulness* of VCoPs is also a critical motivator to employees' participation. Employees must be willing to see a benefit in their use, and the perceived benefit must be greater than the cost of maintaining them. For example, members must feel that if they post questions for help on a particular topic, they will receive helpful feedback from other members. In addition, members should be given ample time to contribute to VCoPs. If the employees are provided time to access VCoPs, then the supply and demand for new and existing knowledge should increase over time.

Another motivator for successful VCoPs is the *IT infrastructure*. The mention of this as a motivator comes as no surprise. Without the technology,

VCoPs would not be able to properly function, and would cease to exist. Employees would not be able to willingly share and use knowledge that should otherwise be available. The infrastructure is equally important to the VCoP as is the physical space to a traditional CoP. Because the IT serves as the basis for a virtual community, it must first be able to satisfy the users' needs (Koh, et al., 2007). According to Koh et al. (2007), the response time of the system should be satisfactory to sufficiently allow for member interaction. In addition, the system should be user-friendly and reliable. As such, the IT infrastructure helps motivators of VCoP participation increase both the level of posting and viewing activity. Therefore, the quality of the IT infrastructure acts as a moderator in the relationship between the VCoP motivators mentioned above and the participants willingness to share and use the knowledge available on the VCoP.

This chapter proposes adding a fifth motivator called *online interaction*. Online interaction deals with the level of interaction that community members face with each other while being in touch through the computer. Online interaction does not necessarily imply that members are online at the same time. With advances in computer-mediated communications, members of a VCoP may be able to stay in contact through asynchronous forms of interaction such as the use of websites, electronic bulletin boards, and email. Synchronous forms of interaction may include live chat and videoconferencing. Online interaction is important in that it is the defining characteristic of a VCoP.

IMPLICATIONS FOR PRACTICE AND RESEARCH

While the motivators provided by Koh et al. (2007), surely seem plausible, additional research needs to be conducted for one primary reason. Researchers need to ask the question, "Do these motivating factors hold true for the Air Force, which oper-

Table 2. Propositions presented

Research question: How do senior Air Force leaders influence employees' participation in VCoPs?
Proposition 1: Employees' willingness to share knowledge (DV) is positively related to leaders' involvement in VCoPs (IV).
Proposition 2: Employees' willingness to use knowledge (DV) is positively related to leaders' involvement in VCoPs (IV).
Proposition 3: Employees' willingness to share knowledge (DV) is positively related to the level of online interaction between members in VCoPs (IV).
Proposition 4: Employees' willingness to use knowledge (DV) is positively related to the level of online interaction between members in VCoPs (IV).
Proposition 5: Employees' willingness to share knowledge (DV) is positively related to the level of offline interaction between members in VCoPs (IV).
Proposition 6: Employees' willingness to use knowledge (DV) is positively related to the level of offline interaction between members in VCoPs (IV).
Proposition 7: Employees' willingness to share knowledge (DV) is positively related to the usefulness of VCoPs (IV).
Proposition 8: Employees' willingness to use knowledge (DV) is positively related to the usefulness of VCoPs (IV).
Proposition 9: The quality of the IT infrastructure in VCoPs (MV) mediates the relationship between leader involvement (IV), the level of offline interaction (IV), and the usefulness (IV) with the employees' willingness to share (DV) and use (DV) knowledge.

ates much differently than a corporation"? Future practitioners should consider further exploring these motivators described by Koh et al (2007) in this context. Once again, they are the impact of leader involvement, online interaction, offline interaction, usefulness, and IT infrastructure quality as predictors of employees' willingness to share knowledge, use knowledge, and use technologies assisting in the daily functions of VCoPs. Future research may consider the following research question and the relating propositions. Please note that DV is dependent variable, IV is independent variable, and MV is mediating variable (Table 2).

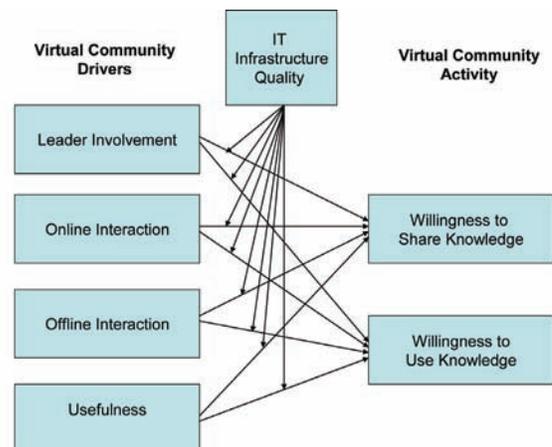
Figure 5 represents a graphic representation of the proposed relationships that exist between the independent, moderating, and dependent variables in the above hypotheses.

FUTURE AREAS FOR RESEARCH

Because studies considering leadership and VCoPs as relational variables are relatively scarce, especially in the realm of the Air Force, there are several potential avenues for future research. Researchers may want to consider revisiting the work of Koh

et al. (2007) to determine if additional motivators play a key role in determining employees' willingness to participate in VCoPs. Researchers may also choose to examine the barriers to VCoP participation. Finally, researchers might consider investigating how the various leadership styles inherent in the Air Force (i.e. transformational and transactional leadership styles) can affect participation in VCoPs.

Figure 5. Virtual community stimulation structure (adapted from Koh et al, 2007, p.70)



The topic to consider for additional research is to determine if other factors act as motivators to employees' participation in VCoPs. For this chapter, there was a focus on the research work conducted by Koh et al. (2007). Other researchers, however, have also attempted to examine motivators to participation in virtual knowledge-sharing communities. Research by Ardichvili et al. (2003) found that employees may be willing to share knowledge because there is a moral obligation and community interest to do so. In addition, contributing knowledge allowed some employees to feel as if they were "experts" in their field, while others felt as if they were "giving back" to the organization. Wasko & Faraj (2005) also found that employees are willing to share their knowledge when it will benefit their reputation. In regards to the use of such knowledge, Ardichvili et al. (2003) found that new employees were willing to use the knowledge to get acquainted much faster. They also found that the knowledge was always available, and it keeps them apprised of developments in their profession. It is important to note that some of these reasons for knowledge use may fall under the "usefulness" motivator developed by Koh et al. (2007). In any case, this area is worth re-examining.

Equally important is being able to understand the barriers to participation in VCoPs. Just as there is a limited amount of research on the relationship surrounding motivators to participation in VCoPs, there is a lack of research on barriers to participation in VCoPs. The work of Ardichvili (2003) found that most employees would not share knowledge because they were afraid of posting something incorrectly, that no one would view it, or because they believed in hoarding all available knowledge. Others stated that the process to post information to VCoPs was time-consuming. Finally, many feared both posting and viewing information because of security reasons.

Finally, researchers may also want to investigate how the leadership styles of the Air Force's leaders (both officers and NCO's) affects

members' participation in VCoPs. Two primary leadership styles have emerged in the mainstream literature: transformational leadership and transactional leadership. Transformational leadership was first introduced by Burns (1978) and studied extensively by Bass (1985). Bass (1985) defines transformational leadership as the leadership style that inspires followers to exceed their own self-interest for the good of the organization. In contrast to the transformational leader, the transactional leader clarifies followers' roles and what must be done in order to obtain desired outcomes and goals (Bass, 1985). Future studies could be done to determine if transformational leaders – or motivational leaders – are better equipped to encourage employee participation in VCoPs versus transactional leaders.

CONCLUSION

KM scholars and practitioners have urged companies to find more effective ways at sharing knowledge to better create and maintain competitive advantages in today's hostile marketplace. This holds true for the Air Force as well. With the aggressive onslaught of modern technologies, VCoPs provide an efficient means by which to achieve this. However, the leaders of the organization are crucial elements in assuring that employees actively participate in VCoPs. Leaders are the driving force in establishing the cultures, systems, and boundaries that promote such knowledge sharing throughout the organization.

This chapter chronicles recent exploratory research designed to examine the role of community drivers as enablers of knowledge sharing in VCoPs. Because little research has centered on this topic, future empirical research is needed concerning the synergistic relationships between motivators and participation in VCoPs. Finally, it is important to note that research should be conducted in various types of organizations that

utilize VCoPs to enhance the generalizability of the findings.

REFERENCES

Allen, S., Ure, D., & Evans, S. (2003). *Virtual Communities of Practice as Learning Networks: Executive Summary* (pp. 50). Brigham Young University Instructional Psychology and Technology Department: The MASIE Center.

Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, 7(1), 64–77. doi:10.1108/13673270310463626

Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs: Prentice Hall.

Bass, B. (1985). *Leadership and performance beyond expectations*. New York: Free Press.

Burns, J. M. (1978). *Leadership*. New York: Harper and Row.

Chen, L. Y., & Barnes, F. B. (2006). Leadership behaviors and knowledge sharing in professional service firms engaged in strategic alliances. *Journal of Applied Management and Entrepreneurship*, 11(2), 51–70.

Ciborra, C. U., & Patriota, G. (1998). Groupware and teamwork in R&D; limits to learning and innovation. *R & D Management*, 28(1), 1–10. doi:10.1111/1467-9310.00080

Connelly, C. E., & Kelloway, E. K. (2003). Predictors of employees' perceptions of knowledge sharing cultures. *Leadership and Organization Development Journal*, 24(5/6), 294–301. doi:10.1108/01437730310485815

DoD. (2005a). Capstone Concept for Joint Operations. Retrieved from http://www.dtic.mil/futurejointwarfare/concepts/approved_ccjov2.pdf

DoD. (2005b). Net-Centric Operational Environment Joint Integrating Concept. Retrieved from http://www.dtic.mil/futurejointwarfare/concepts/netcentric_jic.pdf

DoD. (2007). The Joint Operating Environment: The World Through 2030 and Beyond. Retrieved from <http://www.policefuturists.org/pdf/1May07JOE.pdf>.

Dougherty, D. (1995). Managing your core competencies for corporate venturing. *Entrepreneurship Theory and Practice*, 19(3), 113–135.

Fontaine, M. (2001). Keeping communities of practice afloat. *Knowledge Management Review*, 4(4), 16–21.

Holthouse, D. (1998). Knowledge management research issues. *California Management Review*, 40(3), 277–280.

Horvath, J. A. (1999). *Tacit knowledge in professional practice*. London: Laurence Erlbaum.

Kimble, C., & Hildreth, P. (2005). Dualities, distributed communities of practice and knowledge management. *Journal of Knowledge Management*, 9(4), 102–113. doi:10.1108/13673270510610369

Koh, J., Kim, Y.-G., Butler, B., & Bock, G.-W. (2007). Encouraging participation in virtual communities. *Communications of the ACM*, 50(2), 68–74. doi:10.1145/1216016.1216023

Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate peripheral participation*. Cambridge: University Press.

(2002). *USAF*. Washington, D.C.: Air Force Information Strategy.

USAF. (2003). *The U.S. Air Force Transformation Flight Plan*. Retrieved from http://www.af.mil/library/posture/AF_TRANS_FLIGHT_PLAN-2003.pdf.

Wasko, M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *Management Information Systems Quarterly*, 29(1), 35–57.

Wenger, E. (1998). *Communities of Practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.

Wenger, E. (1999). Learning as Social Participation. *Knowledge Management Review*, 1(6), 30–33.

Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal Online*, 1.

Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review*, 78(1), 139–145.

Chapter 12

Social Knowledge Workspace

Jagdish K. Vasishtha
CoFounder and CEO Injoos, India

ABSTRACT

Over the years, knowledge management in organizations has picked up steam with implementation of various solutions like Content Management Systems, Wiki, etc. However, the ability to find relevant information and capture organizational learning still looks like a distant dream. Also, organizations worldwide are transforming due to changes in worker demographics, globalization of business and technological advances. The knowledge workers of today need tools for effective knowledge capture and team collaboration. Some of the key concerns which will be analyzed in this chapter are; (a) Knowledge fragmentation due to technology, (b) Relevancy of information to a user and (c) Push vs. Pull approach of accessing information. The chapter will also explore how these challenges can be addressed by social knowledge workspaces and what should be some of the key characteristics of these technologies under development.

INTRODUCTION

According to consulting giant McKinsey & Co., nearly 85% of new jobs created between 1998 and 2006 involved complex “knowledge work” like problem-solving and concocting corporate strategy. Malone (2004) has described how today’s organizations only use 30 ~ 40% of their

employee’s intelligence and this will change in the coming years as organizations are now closer to utilizing the full potential of their resources. This according to the author is due to availability of newer and cheaper modes of communication, which places information instantaneously into the hands of team members allowing them to make better choices. This is what he calls democratization of business.

DOI: 10.4018/978-1-60960-203-1.ch012

Peter Drucker (2008) first coined the term Knowledge worker, and proposed that the knowledge worker think and behave like a Chief Executive Officer, which requires them to be able to make their own decision rather than being told what to do. Though this paradigm has been in place for many years the effect of various factors like globalization, collaborative technologies and new economies is assisting the transformation of employees into true knowledge workers.

The goal of this chapter is to highlight some of the challenges faced by organizations in enabling their knowledge workers to capture and share knowledge easily and effectively. Some of the issues explored are (a) Knowledge fragmentation due to technology, (b) Relevancy of information to a user and (c) Push vs. Pull approach of accessing information. The goal is to define a social knowledge workspace and analyze how it could address these issues.

BACKGROUND

As has been seen in the last decade there has been a steady move of jobs in the Information Technology sector from leading countries like USA and UK to developing countries like India and Philippines. Organizations and IT staff in USA and UK have adjusted to this new reality as IT jobs have become more complex and creative. Product design, IT Architecture, Project Management jobs are now held by American employees whereas their Indian counterparts perform the programming and maintenance functions. Thomas Friedman (2006) indicates that in the coming years the best companies will be the best collaborators.

Intellectual Capital is the most important resource for any organization (Stewart, 1997). We have many successful organizations like IBM, GE, Toyota, 3M being able to channel the creativity of their employees into creating cutting edge products and leading global organizations. The former CEO and founder of Information Technology giant

Infosys; N.R Narayana Murthy once pointed out to a journalist that the value of Infosys at 9.15 a.m. in the morning when the workforce was in attendance was \$19 billion, but when they go home at about 6 in the evening, Infosys' valuation was zero. Little wonder that Infosys has won the Most Admired Knowledge Enterprise (MAKE) award successively. Their tagline appropriately sums up this belief, "Powered by Intellect, Driven by values".

Accelerating Innovation

The competitive edge of the United States of America comes from innovating companies and organizations. If you look at the Nobel Prizes won today you will find that the United States wins almost twice as many as the United Kingdom, which appears second on the Nobel Prize list. Many thinkers recently have indicated that the best way for USA to come out of the current economic challenge is to innovate its way out.

Bell Labs filed on an average a patent a day for more than 75 years of its existence and won five Nobel prizes in Physics. Toyota Corporation's in-house idea generation scheme generated over 2 million ideas a year. Over 95% of the workforce contributes with around 30 suggestions per employee where 90% of these suggestions are implemented. Similarly, IBM conducts an annual idea generation boot camp which generates thousands of new ideas many of which are implemented.

Social collaboration technologies can be effectively used for continuous idea generation in organizations. A simple example is an idea drop box. This box would allow employees to submit ideas throughout the year. The whole process can be made transparent by showcasing ideas encouraging others to build upon the ideas or contribute their own ideas. As some of these ideas are implemented the team can be continuously -updated on the status, giving due credit and motivating others to contribute.

Social Aspects of Business

Organizations are seeking new ways to keep employees connected. Studies have shown that employees who are ‘engaged’ tend to be more committed to the organization’s future goals (Smythe, 2007). It is easy to see that engaged and happy people collaborate.

Employee engagement is considered the responsibility of the first level managers (Line Managers or Supervisors). In the current paradigm there is no direct communication channel to the organizational leader (Chief Executive Officer). Hence annual meetings are conducted where the leader energizes and communicates to these first level managers about his vision and external threats the organization faces. These managers in turn are supposed to carry the messages to their respective teams and align their goals to the organizational goals. In addition, the human resource professionals use multiple communication channels to market these messages to employees. It has been observed that employees are switching off to these messages (Smythe, 2007).

As illustrated by John Smythe (2007) in his book “The CEO: Chief Engagement Officer” there is a seismic shift in the psychological contract between employer and employee (Table 1).

He further indicates that besides money employees are looking for the following:

- Employability to grow
- Opportunity to participate in decisions that affect them and on which they can contribute
- Ethics and values they can identify with
- Work-Life balance

This new psychological contract necessitates a direct communication channel between the leader and the employees. Such a direct communication is possible through the use of social knowledge workspaces as we will see in detail later in the chapter.

Telecommuting and the Missing Social Network

A study by Hewitt Associates (Next-Generation Talent Management - Insights on How Workforce Trends Are Changing the Face of Talent Management by Elissa Tucker, Tina Kao, and Nidhi Verma) is calling the new workforce generation as the “Always On” generation working virtually from any location.

The workforce is in the midst of an unstoppable and radical transformation. It is becoming:

Table 1. Psychological contract between employer and employee (Smythe, 2007, pp. 83)

Then	Now
Cradle to grave	Portfolio careers
Loyalty	Transactional relationship
Dependence	Independence
‘Our human resources’	Creative talent on loan
Employees	Citizens
Big institutions	My own company
Command and control	Well-governed inclusivity
CEO = God	CEO = Guide
I left the company	I left my boss
Local community	Workplace communities

1. Smaller and Less Sufficiently Skilled
2. Increasingly Global
3. Highly Virtual
4. Vastly Diverse
5. Autonomous and Empowered (Hewitt, 2005, pp. 1)

Telecommuting at one point was just the privilege of high tech firms where employees could work from the convenience of their homes or used by human resource department for special situations like pregnancy, etc.,. Today telecommuting is main stream and knowledge workers across industry segments have been enjoying the benefits it brings to them and their organizations. A recent survey conducted by EIU (2003) of senior executives found evidence of “a significant upsurge in remote working. In the next two years alone, the number of employers with no employees working from home on a regular basis is predicted to drop from 46% to 20%.

One of the recognized problems of telecommuting has been the lack of social interaction between team members (Zemliansky, 2008). As we will discuss in detail later the collaboration technologies today are social by design and hence reduce this challenge to a large extent. Today’s social networking allows employees to collaboratively view the work of the team, solve problems in real-time, and make suggestions immediately. The team member in a sense gets a feeling of being in a real office performing his tasks just that this would be happening on a virtual collaboration space. The benefits of today’s collaborative work is that employees choose their place of work, and when traveling are not subject to work disruptions. As the costs of bandwidth falls in developing countries a large pool of talented people can now be brought on to bear for an organization’s work without the need for building large office space infrastructures.

SOCIAL KNOWLEDGE WORKSPACE

Knowledge Fragmentation & Information Relevancy

One of the key problems in teams and organizations is knowledge fragmentation (Kock, 2005). There are many reasons for this but the key reason being the way technology has been implemented and used. An example of this technology is Email. Email was originally designed to replace corporate memos but its usage has expanded beyond corporate communications. Email is used to exchange files, forward internet links and short social communications. This has led to what is now commonly known as email overload. This is exaggerated in teams with an email feature called “the group reply” which is a handy way of responding to the whole team. The problem with this feature is that not everyone is interested in your reply, which causes them to read more unnecessary email, wasting valuable work time.

In a recent study by Nielsen Online (2009) ‘Member Communities’ (e.g. social networking websites) has overtaken personal email in consumer reach. This shows a shift from email being the most dominant form of communication on the internet to new social forms of communications. Businesses have yet to recognize this shift as they still rely on earlier modes of communication and collaboration chiefly email. This has created a chasm between how an employee communicates and collaborates in his official and personal spaces.

The personal space has become more sophisticated with the advent of social networking websites. These websites have the characteristics of developing and showcasing relationships among the members. Some of the social networking sites are listed below:

- **Myspace:** Started as website for upcoming and amateur musical artistes to create their own web page and promote their music.

Social Knowledge Workspace

- **Twitter:** A micro blogging website which allows users to broadcast messages up to 140 characters to other users.
- **Facebook:** Provides ability to connect to other users based on interests, college, school, workplace, etc.
- **LinkedIn:** Allows professionals to create a detailed online resume and interact with others by establishing connections. Is increasingly used by corporate human resource recruiters.

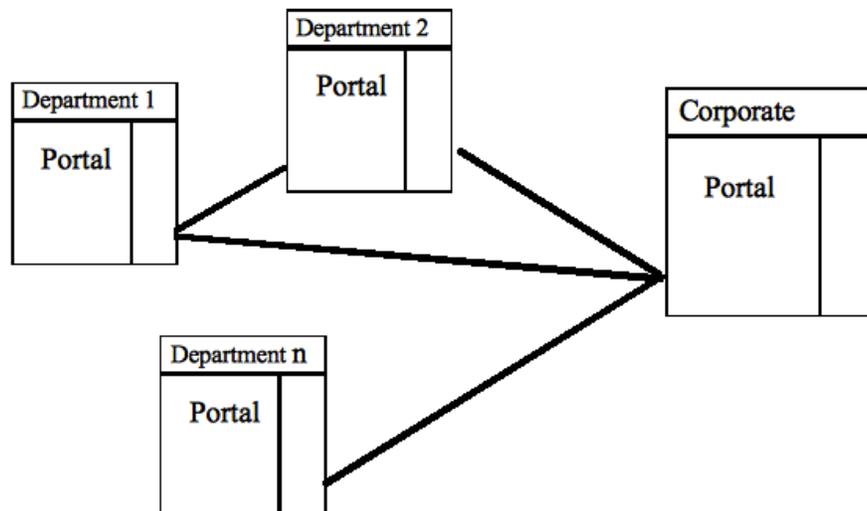
These social networking websites are usually blocked by business and organizations causing a social anguish among employees. Some leading organizations have tried to circumvent this problem by creating their own internal version of these applications for e.g. IBM employee networking application is called Bluebook.

The other key tool to exchange information is the document store or more commonly the file store. The file store can be easily implemented using a file server with access permissions granted to users. Due to the complicated access to the server, users tend to copy the files to their machines creating numerous copies of the same file.

The other challenge is navigating and finding the relevant information among the files stored. Even with smart folder nomenclature this problem is still a very big challenge. Apart from this, there is the challenge of finding the right file version. The file versioning problem has been somewhat surmounted by using sophisticated version management systems, but these are tough to use and configure for a lay user. These version management systems completely ignore the social aspects like popularity and rating of the documents.

Corporate intranets have been implemented by organizations to enable communication and collaboration among team members, providing access to business applications such order management, inventory control, etc. and finally as web publishing platform for journals, newsletters, etc.,. Some of these intranets provide search functionality and have been integrated with a Content Management System (CMS), which acts as a document store. Intranets have simplified searching for information for members. In large organizations an intranet would be a collection of websites created by various departments which is eventually connected to the common company portal as depicted in Figure 1.

Figure 1. Corporate Intranet Silos



One of the problems created by this approach to building intranets is that the knowledge gets locked into each of the departmental or team portals and is not shared across the organization thus creating knowledge fragmentation. Also, due to the old technology commonly referred to as Web1.0 it is not easy for team members to build and maintain their own websites.

Broken Conversations and Google Wave

The problem of information fragmentation is not just restricted to enterprise domain but can be seen in the consumer space also. Google is the leading search engine provider on the World Wide Web but also has developed many applications for consumers over the years. Some examples are Blogger (Blogs), GMAIL (Email), GTALK (Chat) and Google Apps (Spreadsheet & Word processor). These applications were developed as point solutions catering to various communication and collaboration needs of the people. Even though developed by the same organization there was no interlinking between the applications. If your team used all the applications you would have realized that the data residing in each of these applications are in a silo and cannot be accessed from other applications. Some of these problems were removed by integrating the access to these applications using single sign on or through a common interface (GMAIL & GTALK). The problem of information not linking to each other remained and people were not able to continue their conversations across applications. In 2009, Google came up with Wave, which is trying to integrate all the conversations across applications. So if you have posted a comment on Blogger or have chatted with another person on GTALK or sent a document through email these can be threaded into a single conversation stream.

Information Relevancy

Information relevancy is a big problem, but to understand this it has to be broken down into smaller issues namely, Accessibility (How can I get the desired information quickly and easily), Trust (Can I trust this knowledge being provided) and Current (Is this the latest on this information or am I reading dated material). A typical search in an intranet will generate a list of usually dated information which is not relevant to a user. Leading organizations who have teams focused on knowledge management have tried to solve this challenge by creating a separate knowledge management store. Team members are encouraged to contribute to this store, where the documents they submit are peer reviewed and in some cases rated. To increase participation to this forum a carrot and stick approach is followed. Awards are created and participation is linked to annual reviews. This definitely creates a short burst of enthusiasm but is not sustainable (Kelly, 2002). A study conducted in a leading IT organization revealed that close to 80% of members were contributing to the forum, but only 2% were accessing the store for usage of information in their projects. Let us contrast this with how open source communities work on the internet and you can most likely find the information you are looking for 90% of the time. The knowledge is shared and organized by enthusiastic members without the need for any incentive.

Wikipedia has also shown how effectively this can work and today more people are turning towards this online community edited encyclopedia to get answers to many of their queries.

Searching for the Holy Grail

After discussing the Knowledge fragmentation and information relevancy issues we take a look at the third key issue faced by knowledge workers today, searching for information. We spend a lot of time using popular search sites like Google and Yahoo

to surf the internet looking for that one piece of information that could help complete a document we are researching or working on. The search engines have tried to simplify this task by providing a small box where the user types the desired information he is looking for, but the simplicity stops here. Typing those right keywords, the words search engines use to find your information can be difficult. This makes search, time consuming and a frustrating process.

Sometimes it makes more sense to just ask your friend or colleague for that information and maybe his email or her SMS solves your problem faster. This mode of accessing knowledge can be called the “pull” mode.

An alternate to this is possible i.e. the “Push” mode where the most relevant information comes to a user as he or she performs routine tasks rather than make a specific effort to get to the information. To me this should be the real goal of all knowledge management systems.

Constructing a Social Knowledge Workspace

We have analyzed the issues of Knowledge fragmentation, Relevancy of information and Push vs. Pull approach of accessing information. We will now look into how a social knowledge workspace could address these issues.

Social knowledge workspace is an inter connected environment in which all the participants derive value due to; Network of Users (Metcalf Law), Trust between users, Long Tail of Content stored and use tools like Semantic search (RDF, FOAF) and Content enrichment (Linking, Tagging, Rating).

Metcalf's law states that the value of a telecommunications network is proportional to the square of the number of connected users of the system. First formulated in this form by George Gilder in 1993 and attributed to Robert Metcalfe in regard to Ethernet. This so called network effect has been used to explain the growth of World

Wide Web and its value to the user. Knowledge management sites like Wikipedia have shown how a knowledge base can be built by large scale user contribution. Apart from the user participation the knowledge units themselves grow in value as they get cross referenced, linked, tagged and searched.

To understand the idea of trust we could look at the four-part definition provided by James S. Coleman in his book Foundations of Social Theory. *(1) Placement of trust allows actions that otherwise are not possible (i.e. trust allows actions to be conducted based on incomplete information on the case in hand). (2) The person in whom trust is placed (trustee) is Trustworthy, then the trustor will be better off than if he or she had not trusted. Conversely, if the trustee is not trustworthy, then the trustor will be worse off than if he or she had not trusted (this is reminiscent of a classical prisoner's dilemma). (3) Trust is an action that involves a voluntary transfer of resources (physical, financial, intellectual, or temporal) from the trustor to the trustee with no real commitment from the trustee (again prisoner's dilemma). (4) A time lag exists between the extension of trust and the result of the trusting behavior. (Coleman. 1990. pp 94-95)*

The phrase the Long Tail was coined by Chris Anderson (2006) who noted that a relative handful of weblogs have many links going into them but “the long tail” of millions of weblogs may have only a handful of links going into them. Anderson argued that products in low demand or that have a low sales volume can collectively make up a market share that rivals or exceeds the relatively few current bestsellers and blockbusters, if the store or distribution channel is large enough. The long tail concept can be applied to a content repository where less popular documents or blogs can have readers who could derive value from it at any point in the life of the organization. Hence, it becomes important to continuously store and preserve all documents and information items in any organization.

Semantic search improves the search accuracy by understanding the intent of the person searching by looking through the contextual meaning of the search term. When implemented in an intranet it could increase the chance of finding the most relevant document a team member would need. Some of the models used to implement semantic search include Resource Description Framework (RDF) and Friend of a friend (FOAF).

The knowledge workspace can be envisaged using a layered model as depicted in Figure 2. At the base is a set of social collaboration and social media technologies which provide the essential social fabric to organization members to communicate and collaborate. Business applications such as file storage, project management, customer relationship management, etc. are then built on top of this social collaboration layer. Since these applications are essentially integrated using the same social tools they provide an easy way to link various pieces of information of relevance. A unified view to this knowledge base is then provided through a common portal to the team members. Through these portals knowledge can be showcased to the outside world e.g. customers, vendors, etc.

Knowledge fragmentation has been chiefly caused as we discussed earlier due to the way communication and collaboration tools have been implemented in organizations. Apart from email

and content management systems, teams have tried online chats, discussion boards, video conferencing, teleconferencing, Blogs, Wikis, etc.

The challenge being that these tools are used sporadically for various purposes at different times. There is no integration among all these collaboration tools. What is needed is a social knowledge workspace that deploy all these tools where team members can work and collaborate.

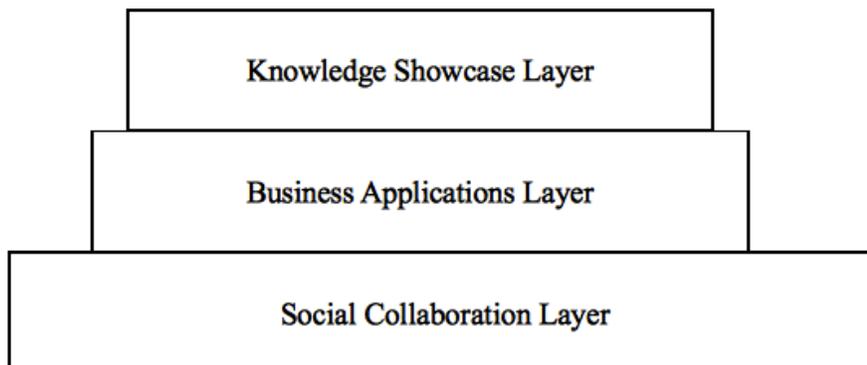
The advantage being that all the transactions which can be classified as chaotic knowledge (Discussions, Chats, etc.) is captured for later use and analysis. This chaotic knowledge can then be linked with structured knowledge (Documents, Videos, etc.) to provide richer information to users.

Today's social media tools provide various ways by which members of a team can link individual pieces of information making a more dynamic and comprehensive information set.

Tagging information elements provide a very effective way of not just classifying information but also linking them. Tag technologies are evolving and now multi layer tags can be built around an information object. What we can see as the result is the ability to find information in a click and avoid guessing search keywords.

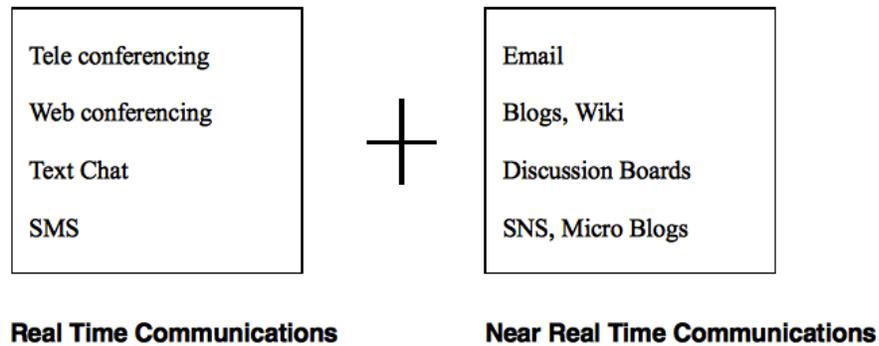
Also a typical tag cloud (collection of tags) provides a way to highlight tags that are more popularly used by a team. This is also a way of highlighting group thinking.

Figure 2. Social knowledge workspace: Layered model



Social Knowledge Workspace

Figure 3. The new unified communications



Tags have been popularized by many social book marking sites like del.icio.us and more recently micro blogging site Twitter.

A social knowledge workspace can exploit the trusted relationships between users to enhance value to the participants. Which team member or colleague has read or rated an information item like Blog or document, indicates relevancy for a community member. The trusted source of information comes from friends, family and colleagues. Today's social collaboration tools build on this paradigm and could prove effective for knowledge management. Members could follow updates on an information item or activities of another colleague. A team member can leave a review comment on a document or could post a question, or response to that would be useful for the whole community. In organizations this also leads to a healthy social competition with the goal of enhancing the team knowledge.

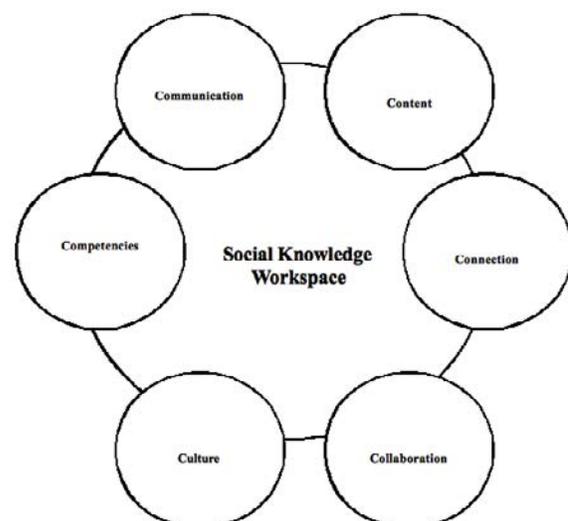
Characteristics of Social Knowledge Workspace

There are clearly six key characteristics which a social knowledge workspace should exhibit (Figure 4).

Communication. The participants should be able to conduct near real time conversations (email, Blog, discussion boards) and real time conversations (chat, web conferencing). The idea is not so

much about these individual tools but being able to start conversations anywhere without worrying about the underlying technology and seamlessly able to connect multiple conversations. Here is an example to illustrate this characteristic. Let us say a participant posts an event in the calendar and others accept to join the event. The participants can then start and join and web conference from the event and store the recorded video in the library and minutes of the meeting notes as simple com-

Figure 4. Characteristics of social knowledge workspaces



ments to the event. On one of the key aspects a participants then launches a discussion thread.

Content. The workspace can be looked upon as a constantly growing repository with contributions from participants; a la Wiki. Going beyond a simple Wiki there should be no restrictions on the media on which the information can be stored. It could be a document file produced by popular word processors, a media file, HTML text or just a photograph. There should be a clear ability for the participants to make this content richer by providing meaningful tags and linking related content.

Connection. Clearly one of the key advancements of the Web 2.0 world has been the ability to connect individuals based on interests, what we call social networking. The workspace should provide the ability to participants to establish connections with various degrees of formality. Participants can explore interests, expertise and be able to follow the activities of other participants. These trusted linkages can then be tapped by participants and the organization for extracting various benefits like expert advice, mentoring, etc.

Collaboration. Leading organizations have always found group collaboration, where people with various specializations come together, effective in solving key organizational challenges. The social knowledge workspace should provide ability to easily organize expert teams to collaborate on a project or a task. For e.g. a document could be edited by multiple folks or white boarding on a new marketing idea.

Culture. One of the key characteristics of such a system is to provide the organization the ability to create and mould its culture beyond the four walls of the physical office space. This is more emphasized where team members are dispersed geographically and could come from multiple cultures. As we have seen in earlier discussions the coming era is of Citizen Employees where the management has to manage constant and transparent communications. For e.g. an instant poll can be conducted on any issue being debated on the bulletin board.

Competencies. Finally the workspace should provide ability to participants to increase their competencies both through structured learning like e-learning modules and through interaction with mentors. The mentor-mentee interaction could happen through a live mechanism like video conferencing or through Q&A boards. All these interactions are recorded automatically in the workspace and could be provided as FAQs to other participants.

Examples of Social Knowledge Workspace Products

There are some early examples of technologies being developed which demonstrate some of the characteristics of the social knowledge workspace as described before. Table 2 lists some of the leading platforms in this space. These platforms have been built keeping a certain user profile in mind and will demonstrate different benefits and hence should not be compared directly. The user is advised to explore many of them as most of them provide a free trial period.

These social knowledge workspaces at the minimum provide the following functionalities:

- Create multiple workspaces
- Ability to group participants and if required create sub groups
- Blogs and Wikis to share knowledge
- A comprehensive media library
- Social networking tools

Table 2. List of social knowledge workspace products ¹

Social Knowledge Workspaces	Website Address
Kinetic Glue	www.kineticglue.com
Cubetree	www.cubetree.com
Atlassian Confluence	www.atlassian.com
Jive Clearspace	www.jivesoftware.com

Social Knowledge Workspace

- Ability to enrich information through rating, tagging, polling
- Team calendar and team websites (dynamic website to showcase group activity to the world on the net)
- Web conferencing and discussion boards
- Moderator and user control

To better understand these tools and how they could prove beneficial to organizations we need to differentiate the needs between large and small organizations. Larger organizations would have higher budgets for IT and have dedicated KM teams and process. There has to be a blend of these new technologies with the existing infrastructure.

For smaller organizations, knowledge rests within individuals and the loss of any member has a big impact on ongoing projects with customers. In addition, there is a limited reliance on structured processes and resources. That is where the power of cloud based social knowledge workspaces can be really seen. Members can access these workspaces anytime, anywhere and securely from multiple devices. Knowledge sharing and capture happens in a social way as team members communicate and collaborate on projects without need of any elaborate process. These systems provide an ability to get a continuous update on a team member's activity without being intrusive about it.

President Obama's TIGR member Andrew McLaughlin, who heads public policy and government affairs for Google, described the use of cloud computing as "*one of the most important transformations the federal government will go through in the next decade*".

FUTURE RESEARCH & DEVELOPMENT

For a knowledge worker the best imaginable solution would be to push relevant information to him. For example, as he reads a recent news clip only the most relevant ones tagged by the people

he trusts and the topics he mostly browsed and which have reached a critical popularity rating is shown to him. The system could generate a live compendium of information related to the topic of his interest trawling the entire knowledge base. The onus should be on the technology to make the interpretation based on an individual's social behavior in determining the most relevant information. While a member is reading a Blog or an email if he is shown relevant Blogs or emails the effort required to find information goes down dramatically.

There has been early development on technologies collectively called semantic web in the internet space which could redefine the way we store, organize and retrieve knowledge. An application of semantic technologies shows big promise to improve knowledge management tools. Ultimately the goal of any social knowledge management system has to be the ability to tap into the collective team intelligence and increase the productivity of the next generation of knowledge workers.

CONCLUSION

A social knowledge workspace can be used in organizations to provide an easy and effective way for knowledge capture and access. These tools will easily capture both chaotic and structured knowledge and eliminate many of the issues plaguing current IT implementations. These tools will take the advancements made by the Social Media and collaboration technologies to enable the next generation of knowledge workers to easily tap into the organization's knowledge base.

REFERENCES

Anderson, C. (2006). *The Long Tail: Why the Future of Business Is Selling Less of More*. New York: Hyperion.

Coleman, J. S. (1994). *Foundations of Social Theory* (pp. 94–95). Watertown, MA: Harvard Business Press.

Drucker, P. F. (2008). *The Essential Drucker: The Best of Sixty Years of Peter Drucker's Essential Writings on Management*. United Kingdom: Harper Collins.

Friedman, T. L. (2006). *The World Is Flat: A Brief History of the Twenty-first Century*. New York: Farrar, Straus and Giroux.

ITAC (2003). *Global Survey Predicts Upsurge in Telework*. (Telework News, Issue 3.3)

Kelly, J. (2002). *Knowledge Nirvana*. Fairfax, VA: Xulon Press.

Kock, N. F. (2005). *Business Process Improvement Through E-collaboration: Knowledge Sharing Through The Use Of Virtual Groups*. Hershey, PA: Idea Group Publishing.

Malone, T. W. (2004). *The Future of Work: How the New Order of Business Will Shape Your Organization, Your Management Style and Your Life*. Watertown, MA: Harvard Business Press.

Nielsen. (2009). *Global Faces and Networked Places: A Nielsen report on Social Networking's New Global Footprint*.

Smythe, J. (2007). *The CEO: Chief Engagement Officer* (pp. 83–84). United Kingdom: Grower.

Stewart, T. (1997). *Intellectual Capital - The New Wealth of Organizations*. New York: Broadway Business The Economist Intelligence Unit. (2003). *Innovation: Remote Working in the Net-Centric Company*. (Executive Briefing)

Tucker, E., Kao, T., & Verma, N. (2005). *Next-Generation Talent Management - Insights on How Workforce Trends Are Changing the Face of Talent Management* (p. 1). Hewitt Associates.

Zemliansky, P., & St Amant, K. (2008). *Handbook of research on virtual workplaces and the new nature of business practices*. Hershey, PA: Information Science Reference.

ADDITIONAL READING

Goleman, D. (2006). *Social Intelligence: The new science of human relationships*. United Kingdom: Hutchison.

Hewitt, H. (2005). *Blog: Understanding the Information reformation that's changing your world*. Nashville, TN: Thomas Nelson, Inc.

Jarvis, J. (2009). *What would Google do?* New York: HarperCollins Publishers.

Li, C., & Bernoff, J. (2008). *Groundswell: Winning in a World Transformed by Social Technologies*. Watertown, MA: Harvard Business Press.

Manouvrier, B., & Menard, L. (Eds.). (2008). *Application Integration: EAI B2B BPM and SOA*. Hoboken, NJ: Wiley. doi:10.1002/9780470611739

McConnell, B., & Huba, J. (2007). *Citizen Marketers: When people are the message*. Chicago, IL: Kaplan Publishing.

Newman, A., & Thomas, J. (2008). *ENTERPRISE 2.0 IMPLEMENTATION: Integrate Web 2.0 Services into Your Enterprise*. United Kingdom: McGraw-Hill.

Rockley, A. (2002). *Managing enterprise content: A unified content strategy*. United Kingdom: New Riders Press.

Tapscott, D., & Williams, A. D. (2008). *Wikinomics: How Mass Collaboration Changes Everything*. New York: Portfolio.

Yu, L. (2007). *Introduction to the Semantic Web and Semantic Web Services*. Boca Raton, FL: Chapman & Hall. doi:10.1201/9781584889342

KEY TERMS AND DEFINITIONS

Content Management System (CMS): A set of IT applications which help an organization, store, retrieve and manage all types of media files.

Enterprise Application Integration (EAI): A model of unifying common data across applications in an enterprise. This usually consists of an integration bus to which various applications connect.

Friend of a Friend (FOAF): A way of describing people and their social networks which is understood by software.

Resource Description Framework (RDF): A set of specifications for modeling information, especially stored on the web.

Social Knowledge Workspace: Is an inter-connected environment in which all the participants derive value due to; Network of Users (Metcalf

Law), Trust between users, Long Tail of Content stored and use tools like Semantic search (RDF, FOAF) and Content enrichment (Linking, Tagging, Rating).

ENDNOTE

- ¹ Cyn.in & Cynapse is the registered trademark of Cynapse India Pvt. Ltd., Groupsite.com is registered trademark of Groupsite.com Inc, Elgg is the registered trademark of Curvedriver Ltd., Injoos Teamware is the registered trademark of Injoos Web Solutions Pvt. Ltd., Jive Clearspace is the registered trademark of Jive Software.

APPENDIX

http://change.gov/newsroom/entry/inside_the_transition_technology_innovation_and_government_reform/. Technology, Innovation and Government Reform team of President Obama.

<http://www.c4lpt.co.uk/Directory/Tools/group.html>. Team, Enterprise, Group Collaboration Tools Directory.

<http://www.mercer.com.au/workplace2012>. Mercer. Workplace 2012 - Beyond Global Financial Crisis.

<http://xmlns.com/foaf/spec/>. FOAF Vocabulary Specification

Chapter 13

Sharing Scientific and Social Knowledge in a Performance Oriented Industry: An Evaluation Model

Haris Papoutsakis

Technological Education Institute of Crete, Greece

ABSTRACT

The chapter evaluates the contribution of shared knowledge and information technology to manufacturing performance. For this purpose, a theoretical model was built and tested in praxis through a research study among manufacturing, quality and R&D groups. The social character of science is perceived as a matter of the aggregation of individuals, not their interactions, and social knowledge as simply the additive outcome of mostly scientists, members of the three groups, making sound scientific judgments. The study results verify the significant contribution of shared knowledge to the manufacturing group performance. They also demonstrate that information technology influences notably the manufacturing group performance and, in a less significant way, the sharing of knowledge. Study results are useful to researchers and the business community alike as they may be used as a springboard for further empirical studies and can help put together strategies involving knowledge management and information technology.

INTRODUCTION

At the turn of the twentieth century many companies (BP, Canon, GlaxoSmithKline, Honda, Siemens and Xerox, among them) have tried, with varied achievement rates, to leverage knowledge assets by centralizing Knowledge Management (KM) functions or by investing heavily in Information Technology (IT) (Davenport and Prusak,

2000; Hansen and von Oetinger, 2001). In parallel, the number of new knowledge management articles, according to Despres and Chauvel (2000, p. 55) "... has more than doubled each year over the past decade". Among them quite a few have proposed and tested models for the management of knowledge, with or without the support of information technologies (Knight, 1999; Larsen et al, 1999; Liebowitz et al, 2000; Kingsley, 2002). A considerably smaller number of such studies have investigated into how companies can le-

DOI: 10.4018/978-1-60960-203-1.ch013

verage knowledge in order to improve business performance (Nelson and Coopriider, 1996; Chong et al, 2000; Firestone, 2001). Only one (Lee and Choi, 2003), among the articles reviewed for this study is combining all three variables: KM, IT and performance. This is exactly the gap this chapter is coming to fill in. Based on careful analysis of the above mentioned previous empirical studies, it builds and empirically tests a model that simultaneously explores the relationships among these three variables and their antecedents.

The chapter is organized in six sections. In the following section the theoretical framework is defined and a brief presentation of relevant previous empirical studies, focused on the links among knowledge management and information technology to business performance is given. In section three, we situate our own model within the above framework. The variables and the investigation hypotheses are defined. In section four, the research methodology is presented and details are given on the questionnaires—the principal research instruments—and the indicators used for construct measurement. In section five, the investigation hypotheses are tested, using regression analysis, and statistical data are given on questions not analyzed elsewhere. Finally, in section six, conclusions are summarized and recommendations are given for managers of collaborating groups in order to increase shared knowledge and to positively affect manufacturing performance.

THEORETICAL BACKGROUND

In the relevant literature, most attempts to investigate the links among KM and IT that lead to improved business performance, are done within the environment of the knowledge-creating company (Nonaka 1991; Nonaka and Takeuchi 1995). Building upon this pioneer work, Grant, in a series of articles (1995 with Baden-Fuller, 1996a, 1996b, 1997) and Sveiby (1997, 2001) presented in a very clear way the fundamentals of

a knowledge-based theory of the firm. According to Grant (1997) –recapitulating on his previous work– the knowledge-based view is founded on a set of basic assumptions. First, knowledge is a vital source for value to be added to business products and services and a key to gaining strategic competitive advantage. Second, explicit and tacit knowledge vary on their transferability, which also depends upon the capacity of the recipient to accumulate knowledge. Third, tacit knowledge rests inside individuals who have a certain learning capacity. The depth of knowledge required for knowledge creation sometimes needs to be sacrificed to the width of knowledge that production applications require. Fourth, most knowledge, and especially explicit knowledge, when developed for a certain application, ought to be made available to additional applications, for reasons of economy of scale.

Theoretically, our research stands upon the ‘knowledge-based theory of the firm’ (Grant, 1997; Sveiby, 2001). The fundamental problem in traditional management theory is how to align the objectives of workers with those of managers and the stakeholders. In accordance with the knowledge-based view, “... if knowledge is the preeminent productive resource, and most knowledge is created by and stored within individuals, then employees are the primary stakeholders” (Grant 1997, p. 452). Under this perspective, management’s principal challenge is to establish the mechanisms for collaborating individuals and groups to coordinate their activities in order to best integrate their knowledge into productive activity. Sveiby (2001) believes that people can use their competence to create value in two directions: by transferring and converting knowledge externally or internally for the organization they belong to. When the managers of a firm direct the efforts of their employees internally, they create tangible goods and intangible structures such as better processes and new designs for products. When they direct their attention outwards, in addition to delivery of goods and money they also

create intangible structures, such as customer relationships, brand awareness, reputation and new experiences for the customers.

For Fukayama (1999), the existence of 'social capital' that serves as a glue to hold diverse constituencies together, is a primary cause of success or failure of any organization. The World Bank defines social capital as "norms and social relations imbedded in social structures that enable people to coordinate actions and achieve desired goals", a definition that applies to countries, societies or organizations. It is here where social knowledge has an important role to play. Individuals develop social knowledge through their interactions with the social environment. Stable systems of social knowledge are organized around certain domains; the collaborating groups in our study. According to Turiel (1983) the acquisition of social knowledge can be interpreted in two different ways: (i) it can be knowledge transmitted to the individual by other persons, and in this case the knowledge acquired is dependent on what is transmitted; or (ii) it can be knowledge constructed by individuals specifically about certain social phenomena (p.1). In an effort to capture the dialectic and dynamic relationship between the individual and social knowledge, Jovchelovitch (2007) develops a social-psychological approach in order to investigate knowledge in every day life. In her framework, problems of social knowledge are discussed in relation to individual, social and collective representations. Knowledge represents at the same time subjective, inter-subjective and objective worlds (p. 168).

It is under the above theoretical perspective that we are reviewing the literature, relevant to our investigation, in the following section.

Previous Empirical Studies

Linking knowledge management and information technologies with business performance has never been an easy task. Comparing KM projects to their two prevailing predecessors (total quality

management and business process re-engineering) Armistead (1999) notices that authors on KM "... do not use the same hard measures of success consistently" (p. 143). He believes that for a knowledge-based view to be useful, it must help improve some key performance indicators like quality, flexibility and cost. Referring to manufacturing companies he notes that operational processes, which depend more on knowledge, are expected to perform well against measurements of quality in consistency, while at the same time they improve productivity.

Our research focused on two basically diverse areas: The measurement—in terms of both qualitative and quantitative results— of a KM project's impact and, at the same time, the identification of the cause-effect relationship that exists between KM, IT, and the overall business performance. Some previous studies captured KM contribution by focusing on intellectual capital measures (Larsen et al, 1999) or accounts and audits (Liebowitz et al, 2000) but both groups of authors question the generability of their studies. Other studies, criticizing conventional performance measures—such as Return On Investment (used by Anderson, 2002) and Economic Value Added, used by multinationals like The Coca-Cola Company— propose measures based on the Balanced Scorecard (Knight, 1999) or other more abstract and tailored to the company, like the Comprehensive Benefit Estimation (Firestone, 2001) and the Cost of Information (Kingsley, 2002). In a recent work the relevant literature summarized above has been extensively reviewed (Papoutsakis and Salvador Valles, 2006).

In most of the above empirical studies the role of shared knowledge among company departments is not consistent, despite the fact that the knowledge transfer process has been studied extensively. Trust and influence have only been recognized as antecedents of shared knowledge by Nelson and Coopride (1996), while Lee and Choi (2003) consider trust and information technology as knowledge creation enablers among seven oth-

ers. What is really missing is an integrative model combining shared knowledge and information technology with performance. Although several studies investigate the relationship between KM and performance (Nelson and Coopriider, 1996; Chong et al, 2000; Firestone, 2001) or IT and KM (Lee and Choi, 2003), they fail to explore the relationships among KM, IT and performance simultaneously.

It is believed that if managers become conscious of the fact that these relationships have interactive features, they can stand a much better chance of improving the performance of their department or company. Measuring the impact of shared knowledge and IT upon manufacturing performance is not an easy task as this will strongly affect the behaviour of managers and employees not only of the manufacturing group, but those of the collaborating groups (in our case the quality and R&D groups). Regarding social knowledge, we have to consider that it exists in the relationships, not in the individuals themselves and thus it requires mutual commitment, since if one party withdraws it disappears. It is under this perspective that we have built and empirically tested the evaluation model proposed in the following section.

PROPOSED MODEL

Aiming to gain insight into the essential factors influencing manufacturing performance, the development and testing of a conceptual model containing the minimum selected theoretical constructs, is considered. Three have been our major concerns, upon building our research model. First, we did not want to propose a model that delineates every possible variable or process that affects manufacturing performance. Second, we wanted to focus on shared knowledge as the leading expression of knowledge management, among the manufacturing, quality and R&D groups of a firm. Third, information technology, in our model,

has been perceived to affect both manufacturing performance and shared knowledge.

To assess the type of knowledge to be shared was also an interesting question. Von Krogh, Ichijo & Nonaka (2000) define knowledge as a justified true belief: when somebody creates knowledge, he or she makes sense out of a new situation by holding justified beliefs and committing to them. The emphasis in this definition is on the conscious act of creating meaning. In our study, we focused on collective knowledge that entails notions of collective belief, truth and justification (Corlett, 1996). Our analysis insisted on particular conditions of inter-group, justified true acceptance which is necessary for collective knowledge. According to Corlett, "... what makes belief, acceptance, justification and knowledge collective is that they are the results of human decision-makers related to one another in groups..." (2007, p.245). Obviously, each one represents his or her group interests.

The road to sharing knowledge lies through individuals, mostly scientists in our study, and is based upon building social relationships and trust, deep dialogue and creative abrasion. There is a need of diversity of ideas and an environment where failures and reflection are valued as learning enablers. Science is the process used everyday to logically complete thoughts through inference of facts determined by calculated experiments. As science itself has developed, the so produced scientific knowledge has developed a broader usage within scientists. The development of scientific methods has made a significant contribution to our understanding of scientific knowledge. To be termed scientific, a method of inquiry must be based on the collection of data through observation and experimentation, and the formulation and testing of hypotheses.

The social dimension of scientific knowledge is of significant importance, as well. We perceive the social character of science as a matter of the aggregation of individuals, not their interactions, and social knowledge as simply the additive

outcome of mostly scientists, members of the three groups, making sound scientific judgments. Philosophers concerned to defend the social character of knowledge and to explore the social dimension of scientific practice (Laudan, 1984; Brown 1989; Goldman, 1995) have approaches that differ in their details but they agree in stating that scientists are persuaded by what they regard as the best evidence or argument, the evidence most indicative of the truth by their lights, and in maintaining that arguments and evidence are the appropriate focus of attention for understanding the production of scientific knowledge. Opposing them, Jovchelovitch (2007) criticizes the narrow association of knowledge with rationalism in the sense of scientific knowledge. As a result, scientific knowledge is viewed as more valid than everyday knowledge.

Therefore, we have opted for our model to highlight a few key factors that can explain a large proportion of the variation noted in manufacturing performance. We have modified the sharing knowledge model validated and used by Nelson & Coopriider (1996) and we enhanced it with links allowing us to draw conclusions on the role and contribution of information technology as an enabler and facilitator towards both manufacturing performance and shared knowledge. Thus, the proposed evaluation model is built to investigate cause and effect links between sharing knowledge, its components, information technology and manufacturing performance.

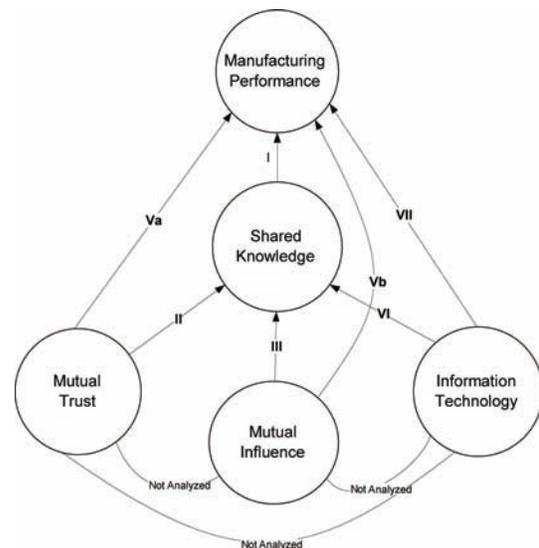
Both general and multiplicative methods are used to measure the indicators, at least two for every construct, and path analysis has been chosen as the analytic technique in this study because it assesses causal relationships (Pedhazur, 1982; Wright, 1971). Pedhazur, building upon Wright, states that "...path analysis is not a method for discovering causes, but a method applied to causal models formulated by the researcher on the basis of knowledge and theoretical considerations." (p. 580). Path diagrams, although not essential for numerical analysis, are useful tools for displaying

graphically the pattern of causal relations among the set of variables under consideration. In this respect we consider the model more appropriate than the intellectual capital or the tangible and intangible approach used in other studies.

Despite the fact that in recent years, social and behavioural scientists have been showing a steadily growing interest in studying patterns of causation among variables, the concept of causation has generated a great deal of controversy among both philosophers and scientists. Nonetheless, causal thinking plays a very important role in scientific research. Even in the works of those scientists who strongly deny the use of the term causation, it is very common to encounter the use of terms that indicate or imply causal thinking. Thus, we can conclude that scientists, in general, seem to have a need to resort to causal frameworks, even though on philosophical grounds they may have reservations about the concept of causation.

Schematically, our empirical evaluation model illustrates the relationships among the five variables as shown in Figure 1. Our seven hypotheses correspond to the causal links of Figure 1 and

Figure 1. The shared knowledge and information technology evaluation model



derive from theoretical statements found in the literature related to knowledge management and information systems and technology. In the following section, we shall elaborate upon the variables incorporated in our model and, at the same time, we shall present our investigation hypotheses.

Finally, it is important to bear in mind that path analysis is a method, and as such its valid application is subject to the competency of the researcher using it and the soundness of the theory that is being tested. Finally, it is the explanatory scheme of the researcher that determines the type of analysis to be applied to data, and not the other way around.

VARIABLES AND HYPOTHESES

Shared Knowledge

Sharing of knowledge is a process distinct from managerial communication, which also deserves consideration. Nelson & Coopriider (1996, p. 411) define Shared Knowledge as “an understanding and appreciation among groups and their managers, for the technologies and processes that affect their mutual performance”. Appreciation and understanding are the two core elements of shared knowledge. Appreciation among diverse groups must be characterized by sensitivity to the point of view and interpretation of the other group, in order to overcome the barriers caused by the different environments and languages used. A deeper level of knowledge must be shared in order to achieve mutual understanding and this is often characterized as organizational knowledge Badaracco (1991).

Lack of this organizational and cross-functionally shared knowledge may result in loses of Manufacturing group performance, while its presence may lead to better performance. As we do not have *a priori* reasons to expect a different relationship, it is here that we are founding our first hypothesis.

Hypothesis 1. *Shared knowledge among Manufacturing, R&D and Quality groups, as perceived by the manufacturing organization, leads to improved manufacturing group performance.*

In an effort to make more comprehensible the relationship between shared knowledge and the manufacturing group performance, we shall now define the two components or antecedents of shared knowledge: Trust and Influence.

Trust

The significance of trust has been given considerable attention and has even been described as a ‘business imperative’ (Davidow and Malone, 1992; Drucker, 1993 among others). In rather similar ways, trust has been defined as “a set of expectations shared by all those in an exchange” (Zucker, 1986) or as “the expectation shared by the [involved] groups that they will meet their commitments to each other” (Nelson and Coopriider, 1996, p. 413) or finally as “... maintaining reciprocal faith in each other in terms of intention and behaviors” (Lee and Choi, 2003, p. 190).

Szulanski (1996) empirically found that the lack of trust among employees is one of the key barriers against knowledge sharing and that the increase in knowledge sharing brought on by mutual trust results in knowledge creation. In the model proposed for this study, it is assumed that Manufacturing, R&D and Quality groups work better in an atmosphere of mutual trust based on mutual commitment and a stable long-term relationship, which is the foundation for our conceptualization of trust. We, thus, hypothesize that mutual trust is a determinant of shared knowledge and it is here that we advance our second hypothesis.

Hypothesis 2. *The perception of increased levels of mutual trust among Manufacturing, R&D and Quality groups leads to increased levels of shared knowledge among these groups.*

Influence

As organizational groups engaged in joint work are often dependent upon each other, influence relationships are created. One way influence is developed, is through the law of reciprocity (Cohen and Bradford, 1989). People expect payback for contribution to an exchange. The perception of reciprocal benefits leads to mutual influence and success in future exchanges among the groups. Nelson and Coopriider (1996, p. 414) define mutual influence as “the ability of groups to affect the key policies and decisions of each other.” Consequently, we expect the following relationship to hold true and it is here that we are basing our third hypothesis.

Hypothesis 3. *Increased levels of mutual influence among manufacturing, R&D and Quality groups lead to increased levels of shared knowledge among these groups.*

The two important aspects with regard to shared knowledge are demonstrated in the evaluation model used for this research (Figure 1). First, mutual trust and influence are presented as antecedents of shared knowledge, and second, shared knowledge is presented as a mediating variable between mutual trust and influence, leading to manufacturing group performance. Therefore, we can hypothesize:

Hypothesis 4. *Shared knowledge acts as a mediating variable between mutual trust and influence and manufacturing performance.*

As we have no *a priori* reasons to exclude that mutual trust and influence could also possibly affect manufacturing performance directly, we are here introducing our fifth hypothesis.

Hypothesis 5. *There is a positive relationship between mutual trust and manufacturing perfor-*

mance, as well as between mutual influence and manufacturing performance.

Information Technology

Davenport & Short (1990, p. 11) define Information Technology (IT) as “...the capabilities offered by computers, software applications, and telecommunications” and further explain that “IT should be viewed as more than an automating or mechanizing force; it can fundamentally reshape the way business is done” (p. 12) and that “IT can make it possible for employees scattered around the world to work as a team” (p. 19). Applegate, McFarlan & McKenney (1999; p. vii) identify IT as: “...computing, communications, business solutions and services...” and further down (note in p. 3) they explain that “...IT refers to technologies of computers and telecommunications (including data, voice, graphics, and full motion video).”

In the new economy era, information technology has a very significant role to play in supporting both communication and, in particular, knowledge sharing. IT affects knowledge sharing in a variety of ways. IT facilitates rapid collection, storage, and exchange of knowledge in a scale not possible up to recent times, thus fully supporting the knowledge sharing process (Roberts, 2000). Specially developed IT integrates fragmented flows of knowledge, eliminating, in this way, barriers to communication among departments (Gold et al, 2001). Advanced IT (like electronic whiteboarding and videoconferencing) encourages all forms of knowledge sharing and is not limited to the transfer of explicit knowledge only (Riggins and Rhee, 1999). Thus, we can hypothesize:

Hypothesis 6. *There is a positive relationship between IT support and the knowledge sharing process.*

The use of certain IT infrastructure such as intranets, extranets, groupware, internet, etc

has been evaluated, in relationship to sharing knowledge, by means of an ad hoc question. IT, in our model, is perceived to affect manufacturing performance, as well.

Manufacturing Performance

Under an industrial business management approach, manufacturing performance has three main activities: (i) the selection of goals; (ii) the consolidation of measurement information relevant to an organization's progress against these goals, and (iii) the interventions made by managers in light of this information with a view to improving future performance against these goals. Although presented here sequentially, typically all three activities will run concurrently, with the interventions made by managers affecting the choice of goals, the measurement information monitored, and the activities being undertaken within the organization.

For the purpose of our study, organizational stakeholders in every participating company have been questioned in order to assess the manufacturing group performance and, in addition, to compare the manufacturing unit under investigation with other units they have managed. Madnick (1991) points out the major ways in which IT support affects manufacturing group performance. First, IT provides opportunities for increased inter- and intra-organizational connectivity and, thus, increases both efficiency and effectiveness. Second, new IT architectures offer significant cost/performance and capacity advances. And finally, with IT support, adaptable organizational structures that lead to significant cost reductions are made possible. As there are other variables (such as employees' competences and qualification, raw material quality, technology level of the machinery in use, etc) which affect manufacturing group performance and are not included in our model, we can only hypothesize:

Hypothesis 7. *There is a positive relationship between IT support and the manufacturing group performance.*

The use of four IT functions (coordination of business tasks, support of decision making, facilitating teamwork and access to information in data bases) has been evaluated, in relationship to manufacturing performance, by means of an ad hoc question.

The five variables incorporated in our model are structured upon a socio-technical perspective that adopts an holistic approach (Pan and Scarbrough 1998). Based on this view, mutual trust and influence, related to the organizational structure and culture as well as to the employees, are considered social variables while, on the other hand, IT is considered a technical variable. For purposes of clarity, most studies consider the impact of social and technical variables independently, a precaution we are also adopting in this study. In the next section, we are presenting the methodology of our research.

RESEARCH DESIGN

In an ideal situation, investigation samples are selected randomly. This is done, among other reasons, for the external validity criteria to be *a priori* fulfilled. The maxim applies to the selection of companies, manufacturing units, and, to a certain extent, to the selection of individuals who answer the questionnaires. As the sample of our study included every company that has accepted to participate we can not disregard a possible selection bias. Finally 51 medium to large size industrial companies, representing 5 sectors (alimentation, automotive, chemical and pharmaceutical, electro-mechanical, and textile) participated in the research. The unit of analysis is the manufacturing group, since the intent of this study is to explain the relationship of organizational subunits (the three collaborating groups)

rather than that of individuals. The size of the company has been used as a criterion and it was convenient that several of the selected companies had multiple manufacturing groups (or departments/lines as they were named) who cooperated with a central R&D and/or quality group.

This has allowed for the research to be addressed to a big number of manufacturing groups, out of which 112 have participated by responding to the relevant questionnaires. Table 1 shows the industrial sectors represented, the number of companies contacted and participated as well as the identified and participating manufacturing units for each one of them. The final sample size, of 112 manufacturing units, is considered sufficient in order to perform path analysis (Pedhazur 1982) and the participation rates achieved in our study (62% at company level and 68% at the unit of analysis level) are considered satisfactory (Cook and Campbell, 1979).

The research responders have been chosen based on the key-informant methodology developed by Phillips and Bagozzi (1986) and included—for each company—manufacturing, R&D and quality group managers or their deputies, as well as senior managers. As the measurement of organizational characteristics requires research methods different from those used for measuring the characteristics of individuals, key-informant methodology is a frequently adopted approach. (Table 1)

Two symmetrical relationship questionnaires, worded in a reverse form, were addressed to Production and Quality or R&D managers -and their assistants- and aimed at portraying the opinion and the attitude of the two collaborating groups towards each other, in terms of sharing knowledge. In addition, the role and level of contribution of Information Technology, both as a tool and/or enabler in supporting sharing knowledge among the collaborating groups was investigated and a last, ad hoc question evaluated the use of commonly used IT infrastructure for inter-firm knowledge sharing.

A third, performance questionnaire –attempting to measure manufacturing group performance– was addressed to senior managers or their assistants. They have been asked to compare the manufacturing group under question, to other comparable manufacturing groups they have managed. In addition, the level of contribution of Information Technology to manufacturing group performance was investigated and again, a last ad hoc question evaluated the use of specific IT functions on four knowledge sharing issues, closely related to the group performance. The questions used, with their indicative numbers, are listed in Appendix I, where we analyze the indicators used for each construct measurement.

The two relationship questionnaires were pilot tested using Production and Quality or R&D managers, and the performance questionnaire was

Table 1. Study participants by sector, company and unit of analysis

Sector	Companies		Manufacturing Units	
	Contacted	Participated	Identified	Participated
Alimentation	26	14	47	31
Automotive	8	6	25	15
Chemical & Pharmaceutical	7	5	22	19
Electro-Mechanical	25	18	54	35
Textile	16	8	17	12
Total	82	51 (62%)	165	112 (68%)

tested using senior executives from a small group of companies not participating in the final phase of our research. Following the completion of each pilot questionnaire, the pilot test informant was debriefed to determine if any questions were confusing for any reason. They were also questioned, whether in their opinion, any significant indicators have been left out of the questionnaire. Based on the results of the pilot test, a number of initially used questions were determined to be poor and were deleted or rephrased. The most important lessons learned through design and pilot testing of the questionnaires are:

- a. In designing the questions, it is essential, to word them in as simple terms as possible and to anchor each question to one specific relationship;
- b. Each question must be customized to include the exact name of the department, as it is used in the company in question.

Despite the above precautions we experienced that the key-informant does not always share the same understanding with the researcher regarding the terminology in use.

Two types of measures have been used to assess the organizational characteristics of shared knowledge, mutual trust, mutual influence, information technology and manufacturing performance. General measures, where each informant is asked to assess the overall level of interaction for a specific characteristic of a particular relationship and multiplicative or interaction measures, where each informant is asked, for example, to assess the role of manufacturing and either R&D or quality group for each characteristic separately. Using the conceptualization of fit as interaction, proposed by Venkatraman (1989), the measurements have been operationalized as “manufacturing role X R&D or quality role”, by multiplying the two responses together.

There are a number of advantages to this measurement scheme, as indicated by Churchill (1979) and Campbell and Fiske (1959): (a) the two types of measures (general and multiplicative) can be thought of as different methods; (b) it provides a stronger test of the validity of the measurement scheme, and (c) it balances possible threats to validity inherent in either type alone.

Manufacturing group performance has been conceptualized in two parts; as operational and service manufacturing performance. Operational or ‘inward’ performance is operationalized as: (a) the quality of the manufacturing group’s work product; (b) the ability of the manufacturing group to meet its organizational commitment, and (c) the ability of the manufacturing organization to meet its goals (first three questions of the performance questionnaire). Service or ‘outward’ performance is operationalized as: (a) the ability of the manufacturing group to react quickly to R&D and/or quality needs, (b) its responsiveness to the R&D and/or quality group and (c) the contribution that the manufacturing group has made to the R&D and/or quality group’s success in meeting its strategic goals (questions four to six of the performance questionnaire).

ANALYSIS OF THE RESULTS

In order to assess the validity of our evaluation model (Figure 1) we empirically tested it using path analysis as the method for studying patterns of causation within the set of independent, mediating and dependent variables used in our evaluation model. For the casual model under consideration, the following preconditions, given by Pedhazur (1982) are essential:

1. The relations among the variables in the model are linear, additive and causal.
2. Each residual is not correlated with the variables that precede it in the model.

This implies that:

- a. The residuals are not correlated among themselves
 - b. All relevant variables are included in the model
 - c. Each endogenous variable is perceived as linear combination of exogenous and/or endogenous variables in the model plus a residual
 - d. Exogenous variables are treated as ‘given’ and when are correlated among themselves, these correlations are also treated as ‘given’ and remain unanalyzed.
3. There is a one-way causal flow in the system.
 4. The variables are measured on an interval scale.
 5. The variables are measured without error.

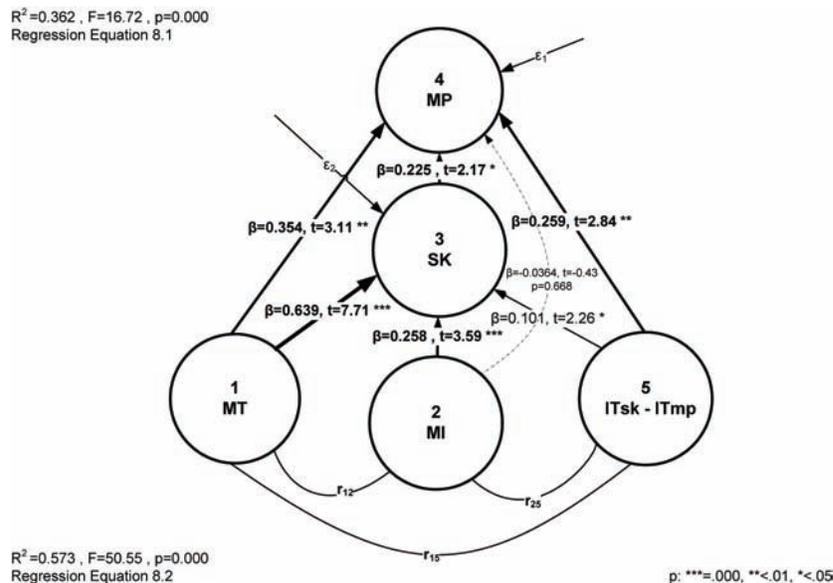
And Pedhazur concludes that “...given the above assumptions, the method of path analysis reduces to the solution of one or more multiple linear regression analyses” (p. 580).

It is under these assumptions that we have concluded to the use of Figure 2, as the research model for our investigation. With one exception: Not all variables affecting Manufacturing Performance are included in the model. Essential variables like skills and qualification of workers, technological level of the machinery in use, and quality of the raw material –just to mention some very basic ones- have not been taken into consideration simply because they do not relate to the focus of our investigation, which is the contribution of shared knowledge and information technology to manufacturing performance. This means that the result of the regression of Manufacturing Performance versus Shared Knowledge could only be considered as a partial causal effect.

Two multiple regressions were run for each of the two dependent variables, manufacturing performance and shared knowledge. Testing the hypotheses requires testing the significance of paths I, II, III, Va, Vb, VI and VII as presented in Figure 1. The results of this analysis are schematically shown in Figure 2 and in the generic regression equations below:

For manufacturing performance:

Figure 2. Regressions in the evaluation model



$$MPC = \alpha + \beta_1 SKC + \beta_2 MTC + \beta_3 MIC + \beta_4 ITmpC + e \quad (8.1)$$

For shared knowledge:

$$SKC = \alpha + \beta_1 MTC + \beta_2 MIC + \beta_3 ITskC + e \quad (8.2)$$

Two points need to be clarified in the above equations:

1. β 's, the normalized path coefficients, indicate the direct impact of a variable hypothesized as a cause on a variable taken as an effect. Wright (1934) defines a path coefficient as: "The fraction of the standard deviation of the dependent variable (with the appropriate sign) for which the designated factor [here, the independent or mediating variable] is directly responsible..." (p. 162). Under the previously analyzed preconditions, path coefficients take the form of ordinary least squares solutions for the β 's (Pedhazur 1982, pp. 582-584).

The third letter C, added to the two-letter acronym used for each one of the variables, indicates that we are referring to its Construct. As at least two indicators have been used to assess every variable in the research model, the construct is the mean of these indicators. In the acronym of information technology, the indicators mp and sk are used to distinguish: (a) ITskC, the IT construct measured through the two relationship questionnaires, in reference to shared knowledge, and (b) ITmpC, the IT construct measured through the performance questionnaire, in reference to manufacturing performance. As these two types of questionnaires have been filled in by different key-informants we could not use a possible IT Construct (ITC) produced as the mean of ITskC and ITmpC.

Regressions in the evaluation model have been conducted in hierarchical order. First, we examined

the relationship between manufacturing performance and each one of the variables affecting it; shared knowledge, mutual trust and influence, and information technology as described in the first regression equation. And the resulting equation is:

$$MPC = 6.98 + 0.354 MTC - 0.0364 MIC + 0.225 SKC + 0.259 ITmpC + e_1$$

At this point, and for the better understanding of the analysis following, some more statistical terms need to be clarified:

1. R^2 , in the case of multiple independent variables, indicates the squared multiple correlation, i.e. the proportion of variance of the dependent variable accounted for by the independent variables.
2. The t-value ($-\infty < t > +\infty$) determines the level of significance of the β 's, and finally,
3. F, the ratio of the mean square regression to the mean square residual, provides a statistic for testing the null hypothesis. When the calculated F exceeds the tabled value of F, with the associated degrees of freedom and at a preselected level of significance p (i.e. $p=0.000$, or $p<.05$), the conclusion is to reject the null hypothesis.

In this first regression mutual trust, information technologies and shared knowledge are found to affect manufacturing performance significantly, while mutual influence does not ($\beta=-0,0364$, $t=-0.43$, $p=0.668$). The regression model described by the equation 5.1 is significant ($F=16.72$, $p=0.000$), but $R^2=0.362$ suggests that only 36.2 percent of the variance is explained by the five variables involved. This is something we expected, as we have already noted, upon founding hypothesis 7, that there are significant factors affecting manufacturing performance which are not included in our model.

Then, we examined the relationship among shared knowledge, mutual trust and influence, and

information technology, as described by the second regression equation, and here are the results:

$$SKC = 1.08 + 0.639 MTC + 0.258 MIC + 0.101 ITskC + e_2$$

In this second regression, mutual trust, mutual influence and information technology are all found to affect shared knowledge with variable strengths. The regression model described by the equation 5.2 is significant ($F=50.55$, $p=0.000$) and $R^2=0.573$ suggests that 57.3 percent of the variance is explained by these three variables.

Consistency of the model with the data, however, does not constitute proof of the theory; at best it only provides support to it. Following Popper's (1959) basic argument that all one can achieve through investigation is the falsification of theory, we would have to conclude that the theory has survived the test, in that it has not been disconfirmed. Thus, in direct connection with our investigation hypotheses, the regression results indicate that:

1. Hypotheses 1, 2, 3, 6 and 7 are directly supported by the significance of paths I, II, III, VI and VII respectively. This means that: (a) Shared knowledge among Manufacturing, R&D and Quality groups, as perceived by the manufacturing organization, leads to improved manufacturing group performance. (b) The perception of increased levels of mutual trust among Manufacturing, R&D and Quality groups leads to increased levels of shared knowledge among these groups. (c) Increased levels of mutual influence among Manufacturing, R&D and Quality groups lead to increased levels of shared knowledge among these groups. (d) There is a positive relationship between IT support and the Knowledge sharing process. (e) There is a positive relationship between IT support and the manufacturing group performance.

2. Hypotheses 4 and 5 are each only partially supported as they could not both together stand true. This means that: (a) Shared knowledge acts as a mediating variable only for mutual influence, while mutual trust appears to also significantly affect manufacturing performance in a direct way (significance of path Va). (b) Mutual influence does not directly affect manufacturing performance (statistically insignificant *beta* for path Vb).

There is an important note to be made at this point. To the extent that *beta* values reflect the strength of the cause-effect relationship, we may say that IT does not affect shared knowledge in the same significant way that it affects manufacturing performance. This result may first be explained by the fact that information technologies mainly affect transfer and sharing of explicit knowledge, while in the environment of our study (shared knowledge among manufacturing, quality and R&D groups) tacit knowledge plays a dominant role. The result is also in accordance with findings of other studies. Lee and Choi (2003) have found that IT support is significantly related only with knowledge combination (explicit to explicit knowledge transactions) while they have noticed no significant relation with any of the other three knowledge creation processes (socialization, externalization and internalization) where tacit knowledge is also involved.

The second explanation has to do with the research instruments. In our investigation, the two constructs of information technology (ITskC and ITmpC) were measured on two separate instruments, the symmetrical relationship questionnaires, and the performance questionnaire. The two separate instruments were filled out by different key-informants at different levels within the organization. It is anticipated that collaborating group managers on one hand, and senior managers on the other, might have different background conditions, when asked to judge the same concept. Pedhazur (1982) attributes these differences to

the personal characteristics of key-informers, like cognitive styles, self-concept, ego strength and attitudes.

Use of IT Infrastructure

The last question in the two relationship questionnaires is examining the use of certain IT infrastructure as tools and enablers for sharing knowledge, among Manufacturing, Quality and/or R&D groups. Study results indicate that managers or their deputies of the three collaborating groups strongly use E-mail (86.6%), Intranets (71%) and Internet (42.85%), and at lower, but still noteworthy percentages, Data Warehouse software (30%), Extranets (23.65%), Groupware software (20.95) and Workflow software (11.6%) in their daily work. Percentages here and in the following paragraph refer to the sum of 'strong' answers (grouped Likert ratings 5, 6 and 7).

Use of IT Functions

The last question in the manufacturing performance questionnaire is investigating the use of certain IT functions by the company as a whole. According to our study, senior managers report that group managers use at relatively high percentages all four IT functions, in order to: facilitate access of information in Data Bases (84.4%), coordinate business tasks (82.6%), facilitate team members to work together (76.4%) and support decisions making (69.2%).

Confirmatory Tests

Four confirmatory tests of the research model were performed and the results obtained are briefly presented here. Cronbach's *alphas* (all ranged from 0.7819 to 0.9994) were utilized to reassure the reliability of the instruments used (Nunnally, 1978).

Convergent and discriminant validity has been checked by the Multi-Trait Multi-Method correla-

tion matrix and all correlations within constructs have been found to be higher than any correlations across constructs (Campbell and Fiske, 1959).

Linearity and collinearity tests are essential for the assumptions of regression analysis to be met. Because the scatter plots of individual variables did not indicate any nonlinear relationships, the linearity was guaranteed. In addition, we tested the plots of residuals against the explanatory variables. As they showed no model inadequacies, we assume that no variable violates the constant variance. Collinearity among the variables involved in the two regression equations was tested by the Variance Inflation Factors which in our study ranged from 1.1 to 2.3 (in the first regression equation) and from 1.1 to 1.3 in the second. Hence, we have taken for granted that there is no multicollinearity problem (Neter et al, 1996).

Finally, the analysis of variance was used to check via an alternative method, two of the results obtained through Multiple Regression (Pedhazur, 1982; Draper and Smith, 1980).

- a. The corresponding values of r (or $R-S_q$) were re-calculated and found in accordance with the previously calculated R 's:
 $r=0.3846$ compared to $R=0.362$ for the first regression equation, and
 $r=0.58406$ compared to $R=0.573$ for the second regression equation.
- b. The regression models used were found significant because both F -ratios were larger than the corresponding critical F -values:
 $F=16.72 \gg F(0.01; 4, 107) = 3.50$ for the first regression equation, and
 $F=50.55 \gg F(0.01; 3, 108) = 3.96$ for the second regression equation.

The statistical results of the two regression equations and those of the confirmatory tests are presented in Appendix II.

LIMITATIONS AND FUTURE RESEARCH

We acknowledge two limitations for our study. The first one is theoretical:

- a. The development of mutual trust and influence leading to shared knowledge and the influence of information technology are all ongoing phenomena. In our study, these constructs were measured at a static point in time rather than as they develop. A future research could possibly investigate the relationship of ongoing changes to manufacturing group performance, maintaining the same company sample. It would also be interesting to possibly relate the changes noted over time, with actual changes in both the social (mutual trust and influence) and the technical (information technology) subsystems within the organization.
- b. The study was conducted in Spain. A new multinational study in three more European Union countries, namely Finland, Greece and Hungary is currently under development and we hope that it will further support our findings.

CONCLUSION

The results of this study demonstrate the positive contribution of shared knowledge and information technology to manufacturing performance. Based primarily on the above results and to a certain extent on the literature reviewed, we come to the following socio-technical conclusion. Sharing knowledge in a meaningful manner requires a well balanced merge of technology with the company's culture, in a way that creates an environment supporting collaboration. Trust has been identified, through our study, as one of the company's core values. Management has to create a climate of trust in the organization, for knowledge shar-

ing to become reality. In such an environment scientists from different groups (Manufacturing, Quality and R&D) feel comfortable to look for others with the 'missing piece of individual and social knowledge' to share. As shown by this study, influence is the second necessary condition for, and can lead to cooperative behavior among individuals and groups, especially where tacit knowledge has to be shared. It is only in such an environment that the IT made available may lead to innovative products.

The findings of this study indicate that Manufacturing, Quality and R&D groups have the opportunity to develop mutual trust and influence through repeated periods of positive face-to-face or IT-based communication, social interaction and common goal accomplishment. Such behavioral features result to increased shared knowledge regarding the groups' common problems, procedures and know-how. It is clearly illustrated that it is in the hands of management to increase manufacturing performance by improving the channels for individual and social knowledge to be shared among the three groups and by selecting the information technologies that best fit the innovative efforts and competitive strategy of their organization.

REFERENCES

- Anderson, M. (2002). Measuring Intangible Value: The ROI of Knowledge Management. Retrieved July 12, 2004, from http://www1.astd.org/news_letter/november/Links/anderson.html
- Applegate, L. M., McFarlan, F. W., & McKenney, J. L. (1999). *Corporate Information Systems Management: Text and Cases* (5th ed.). USA: Irwin/McGraw-Hill.
- Armistead, C. (1999). Knowledge Management and Process Performance. *Journal of Knowledge Management*, 3(2), 143–154. doi:10.1108/13673279910275602

- Badaracco, J. (1991). *The Knowledge Link: How Firms Compete through Strategic Alliances*. Boston, MA: Harvard Business School Press.
- Brown, J. (1989). *The Rational and the Social*. London: Routledge.
- Byrne, B. M. (1988). Measuring Adolescent Self-Concept: Factorial Validity and Equivalency of the SDQ III Across Gender. *Multivariate Behavioral Research*, 23(7), 361–375. doi:10.1207/s15327906mbr2303_5
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. *Psychological Bulletin*, 56(2), 81–105. doi:10.1037/h0046016
- Chong, C. W., Holden, T., Wilhelmij, P., & Schmidt, R. A. (2000). Where Does Knowledge Management Add Value? *Journal of Intellectual Capital*, 1(4), 366–380. doi:10.1108/14691930010359261
- Churchill, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *JMR, Journal of Marketing Research*, 16(1), 64–73. doi:10.2307/3150876
- Cohen, A. R., & Bradford, D. L. (1989). Influence without Authority: The Use of Alliances, Reciprocity and Exchange to Accomplish Work. *Organizational Dynamics*, 17(3), 4–18. doi:10.1016/0090-2616(89)90033-8
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-Experimentation: Design & Analysis Issues for Field Settings*. Boston, MA: Houghton Mifflin Company.
- Corlett, J. A. (1996). *Analyzing Social Knowledge*. Totowa: Rowman & Littlefield Publishers.
- Corlett, J. A. (2007). Analyzing Social Knowledge. *Social Epistemology*, 21(3), 231–247. doi:10.1080/02691720701674049
- Davenport, T. H., & Prusak, L. (2000). *Working Knowledge: How Organizations Manage what they Know*. Cambridge, MA: Harvard Business School Press.
- Davenport, T.H., & Short, J.E. (1990). The New Industrial Engineering: Information Technology and Business Process Redesign. *Sloan Management Review*, 31(summer), 11-27.
- Davidow, W. H., & Malone, M. (1992). *The Virtual Corporation*. London: Harper Collins.
- Despres, C., & Chauvel, D. (2000). A Thematic Analysis of the Thinking in Knowledge Management. In Despres, C., & Chauvel, D. (Eds.), *Knowledge Horizons: The Present and the Promise of Knowledge Management*. Boston, MA: Butterworth-Heinemann.
- Draper, N. R., & Smith, H. (1980). *Applied Regression Analysis* (2nd ed.). New York: John Wiley & Sons.
- Firestone, J. M. (2001). Estimating Benefits of Knowledge Management Initiatives: Concepts, Methodology and Tools. *Journal of the KMCI*, 1(3), 110–129.
- Fukuyama, F. (1999). *The Great Disruption*. Simon & Schuster.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge Management: An Organizational Capabilities Perspective. *Journal of Management Information Systems*, 18(1), 185–214.
- Goldman, A. (1995). Psychological, Social and Epistemic Factors in the Theory of Science. In M. Forbes & R. Burian (Eds.), *PSA 1994: Proceedings of the 1994 Biennial Meeting of the Philosophy of Science Association* (pp. 277-286). East Lansing, MI: Philosophy of Science Association.
- Grant, R. M. (1996a). Prospering in Dynamically-competitive Environments: Organizational Capability as Knowledge Integration. *Organization Science*, 7(4), 375–387. doi:10.1287/orsc.7.4.375

- Grant, R. M. (1996b). Towards a Knowledge-based Theory of the Firm. [Special Issue entitled Knowledge and the Firm]. *Strategic Management Journal*, 17(4), 109–122.
- Grant, R. M. (1997). Knowledge-based View of the Firm: Implications for Management Practice. *Long Range Planning*, 30(3), 450–454. doi:10.1016/S0024-6301(97)00025-3
- Grant, R. M., & Baden-Fuller, C. (1995). A Knowledge-based Theory of Inter-firm Collaboration. In *Academy of Management Best Papers Proceedings*.
- Hansen, M. T., & von Oetinger, B. (2001). Introducing T-Shaped Managers: Knowledge Management's Next Generation. *Harvard Business Review*, 79(3), 107–116.
- Jovchelovitch, S. (2007). *Knowledge in Context: Representations, Community and Culture*. London: Routledge.
- Kingsley, M. (2002). Measuring the Return on Knowledge Management. Retrieved on July 14, 2004, from <http://www.llrx.com/features/kmroi.html>
- Knight, D. J. (1999). Performance Measures for Increasing Intellectual Capital. *Strategy and Leadership*, 27(2), 22–27. doi:10.1108/eb054632
- Larsen, H. T., Bukh, P. N. D., & Mouritsen, J. (1999). Intellectual Capital Statements and Knowledge Management: 'Measuring' 'Reporting' 'Acting'. *Australian Accounting Review*, 9(3), 15–26. doi:10.1111/j.1835-2561.1999.tb00113.x
- Laudan, L. (1984). The Pseudo-Science of Science? In Brown, J. (Ed.), *Scientific Rationality: The Sociological Turn* (pp. 41–74). Dordrecht, Holland: Reidel.
- Lee, H., & Choi, B. (2003). Knowledge Management Enablers Processes and Organizational Performance: An Integrative View and Empirical Study. *Journal of Management Information Systems*, 20(1), 179–228.
- Liebowitz, J., Rubenstein-Montano, B., McCaw, D., Buchwalter, J., Browning, C., Newman, B., & Rebeck, K. Knowledge Management Methodology Team. (2000). The Knowledge Audit. *Knowledge and Process Management*, (1): 3–10. doi:10.1002/(SICI)1099-1441(200001/03)7:1<3::AID-KPM72>3.0.CO;2-0
- Madnick, S. E. (1991). The Information Technology Platform. In Morton, S. (Ed.), *The Corporation of the 1990s* (pp. 27–60). New York: Oxford University Press.
- Nelson, K. M., & Coopridge, J. G. (1996). The Contribution of Shared Knowledge to IS Group Performance. *Management Information Systems Quarterly*, 20(4), 409–429. doi:10.2307/249562
- Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied Linear Statistical Models*. USA: Irwin.
- Nonaka, I. (1991). The Knowledge-Creating Company. *Harvard Business Review*, 69(6), 96–104.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company*. Boston, MA: Oxford University Press.
- Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill.
- Pan, S., & Scarbrough, H. (1998). A Socio-technical View of Knowledge-sharing at Buckman Laboratories. *Journal of Knowledge Management*, 2(1), 55–66. doi:10.1108/EUM00000000004607
- Papoutsakis, H., & Salvador Valles, R. (2006). Linking Knowledge Management and Information Technology to Business Performance: A Literature Review and a Proposed Model. *Journal of Knowledge Management Practice*, 7(1).
- Pedhazur, E. J. (1982). *Multiple Regression in Behavioral Research*. New York: CBS College Publishing.

- Phillips, L. W., & Bagozzi, R. P. (1986). On Measuring Organizational Properties of Distributional Channels: Methodology Issues in the Use of Key Informants. *Research in Marketing*, 8, 313–369.
- Popper, K. R. (1959). *The Logic of Scientific Discovery*. New York: Basic Books.
- Riggins, F. G., & Rhee, H. (1999). Developing the Learning Network Using Extranets. *International Journal of Electronic Commerce*, 4(1), 65–83.
- Roberts, J. (2000). From Know-how to Show-how?: Questioning the Role of Information and Communication Technologies in Knowledge Transfer. *Technology Analysis and Strategic Management*, 12(4), 429–443. doi:10.1080/713698499
- Sveiby, K. E. (1997). *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*. Berrett-Koehler Publishers Inc.
- Sveiby, K. E. (2001). A Knowledge-based Theory of the Firm To Guide Strategy Formulation. *Journal of Intellectual Capital*, 2(4), 344–358. doi:10.1108/14691930110409651
- Szulanski, G. (1996). Exploring Internal Stickiness: Impediments to the Transfer of Best Practice within the Firm. *Strategic Management Journal*, 17(10), 27–43.
- Turiel, E. (1983). *The Development of Social Knowledge: Morality & Convention*. Cambridge, UK: Cambridge University Press.
- Venkatraman, N. (1989). The Concept of Fit in Strategy Research: Toward Verbal and Statistical Correspondence. *Academy of Management Review*, 14(3), 423–444. doi:10.2307/258177
- von Krogh, G., Ichigo, K., & Nonaka, I. (2000). *Enabling Knowledge Creation. How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*. New York: Oxford University Press.
- Wright, S. (1934). The method of path coefficients. *Annals of Mathematical Statistics*, 5, 161–215. doi:10.1214/aoms/1177732676
- Wright, S. (1971). Path Coefficients and Path Regressions: Alternative or Complementary Concepts? In Blalock, H. M. (Ed.), *Causal Models in the Social Sciences* (pp. 101–114). Chicago: Aldine Publishing Co.
- Zucker, L. (1986). Production of Trust: Institutional Sources of Economic Structure 1840–1920. In B.M. Staw & L.L. Cummings, (Ed.), *Research in Organizational Behavior*, 8, 53–111.

KEY TERMS AND DEFINITIONS

Shared Knowledge: “... an understanding and appreciation among [collaborating] groups and their managers, for the technologies and processes that affect their mutual performance” (Nelson & Coopriider 1996, p. 411). Appreciation and understanding are the two core elements of shared knowledge. Appreciation among diverse groups must be characterized by sensitivity to the point of view and interpretation of the other group, in order to overcome the barriers caused by the different environments and languages used. A deeper level of knowledge must be shared in order to achieve mutual understanding and this is often characterized as organizational knowledge Badaracco (1991).

Scientific Knowledge: Science is the process used everyday to logically complete thoughts through inference of facts determined by calculated experiments. As science itself has developed, the so produced scientific knowledge has developed a broader usage within scientists. The development of scientific methods has made a significant contribution to our understanding of scientific knowledge. To be termed scientific, a method of inquiry must be based on the collection

of data through observation and experimentation, and the formulation and testing of hypotheses.

Social Knowledge: Individuals develop social knowledge through their interactions with the social environment. Stable systems of social knowledge are organized around certain domains; the collaborating groups in our study. According to Turiel (1983) the acquisition of social knowledge can be interpreted in two different ways: (i) it can be knowledge transmitted to the individual by other persons, and in this case the knowledge acquired is dependent on what is transmitted; or (ii) it can be knowledge constructed by individuals specifically about certain social phenomena. The social dimension of scientific knowledge is of significant importance, as well. We perceive the social character of science as a matter of the aggregation of individuals, not their interactions, and social knowledge as simply the additive outcome of mostly scientists, members of the three groups, making sound scientific judgments.

Trust: has been defined as “a set of expectations shared by all those in an exchange” (Zucker, 1986) or as “the expectation shared by the [involved] groups that they will meet their commitments to each other” (Nelson and Coopriider, 1996, p. 413) or finally as “... maintaining reciprocal faith in each other in terms of intention and behaviors” (Lee and Choi, 2003, p. 190). The significance of trust has been given considerable attention and has even been described as a ‘business imperative’ (Davidow and Malone, 1992; Drucker, 1993 among others).

Influence: Nelson and Coopriider (1996, p. 414) define mutual influence as “the ability of groups to affect the key policies and decisions of each other.” As organizational groups engaged in joint work are often dependent upon each other, influence relationships are created. One way influence is developed, is through the law of reciproc-

ity. People expect payback for contribution to an exchange. The perception of reciprocal benefits leads to mutual influence and success in future exchanges among the groups. In our study, trust and influence have been recognized as antecedents of shared knowledge.

Information Technology: Davenport & Short (1990, p. 11) define Information Technology (IT) as “...the capabilities offered by computers, software applications, and telecommunications” and further explain that “IT should be viewed as more than an automating or mechanizing force; it can fundamentally reshape the way business is done” (p. 12) and that “IT can make it possible for employees scattered around the world to work as a team” (p. 19). Applegate, McFarlan & McKenney (1999; p. vii) identify IT as: “... computing, communications, business solutions and services...” and further down (note in p. 3) they explain that “...IT refers to technologies of computers and telecommunications (including data, voice, graphics, and full motion video).”

Performance: Under an industrial business management approach, manufacturing performance has three main activities: (i) the selection of goals; (ii) the consolidation of measurement information relevant to an organization’s progress against these goals, and (iii) the interventions made by managers in light of this information with a view to improving future performance against these goals. Although presented here sequentially, typically all three activities will run concurrently, with the interventions made by managers affecting the choice of goals, the measurement information monitored, and the activities being undertaken within the organization.

APPENDIX I: QUESTIONNAIRES AND CONSTRUCT MEASUREMENT

For reasons of economy of space the three Questionnaires (Relationship Questionnaires Type A and B and Performance Questionnaire Type C) are not presented separately. All the questions are listed, with their indicative number, upon analyzing the Indicators used for each Construct Measurement. In every question below, titles in brackets were customized to reflect the exact names of the participating organizations and functional groups, as they are used in every firm.

1. **RELATIONSHIP QUESTIONNAIRES** (Type A and B) included twelve questions aiming to measure:
 - Dependent or mediating variable Sharing Knowledge (3 questions)
 - Independent variable Mutual Trust (2 questions)
 - Independent variable Mutual Influence (4 questions)
 - The role and level of contribution of Information Technology (ITsk), both as a tool and/or enabler in supporting sharing knowledge among Manufacturing, Quality and/or R&D groups (2 questions)
 - The use of IT infrastructure –under the above described concept (1 question with multiple sub questions. Results are given in pie-chart form and are not presented here.)

Please characterize the general working relationship that currently exists between the

[Manufacturing] group and the [Quality or R&D] group → (Questionnaire Type A), or

[Quality or R&D] group and the [Manufacturing] group → (Questionnaire Type B).

Use Table 2 to measure constructs:

Table 2.

1	2	3	4	5	6	7
Extremely Weak	Weak	Moderately Weak	About Average	Moderately Strong	Strong	Extremely Strong

Shared Knowledge*

The three indicators of shared knowledge have been designed to assess the level of understanding or appreciation which the members of the three groups have of each others' work environments. Indicators 1 and 3 assess the level of appreciation that each participant has for what their partners (in the other group) have accomplished, by using general and multiplicative assessments respectively. The second indicator measures the level of understanding that the members of the three groups have of each others' work environments.

Sharing Scientific and Social Knowledge in a Performance Oriented Industry

Shared Knowledge Indicator 1: (General Assessment, **Mean 5.2991**; SD 0.6957; Range 4)

A1/B1. The level of appreciation that the [Manufacturing] group and the [Quality or R&D] group have for each other's accomplishments is:

A1. (**Mean 5.35714**; SD 0.79250; Range 4)

B1. (**Mean 5.24107**; SD 0.84091; Range 4)

Shared Knowledge Indicator 2: (Multiplicative Assessment, **Mean 25.152**; SD 8.604; Range 44)

The product of the responses to the following:

A2. The level of understanding of the [Quality or R&D] group for the work environment (problems, tasks, roles, etc) of the [Manufacturing] group is:

(**Mean 4.84821**; SD 1.10045; Range 6)

B2. The level of understanding of the [Manufacturing] group for the work environment (problems, tasks, roles, etc) of the [Quality or R&D] group is:

(**Mean 5.17857**; SD 0.91252; Range 5)

Shared Knowledge Indicator 3: (Multiplicative Assessment, **Mean 26.652**; SD 8.157; Range 40)

The product of the responses to the following:

A3. The level of appreciation that the [Quality or R&D] group has for the accomplishments of the [Manufacturing] group is:

(**Mean 5.07143**; SD 0.97458; Range 4)

B3. The level of appreciation that the [Manufacturing] group has for the accomplishments of the [Quality or R&D] group is:

(**Mean 5.17857**; SD 0.91252; Range 5)

Shared Knowledge Construct: The mean of the above indicators (**Mean 19.034**; SD 5.180; Range 23.667).

Mutual Trust*

The two indicators of predisposition measure the extent to which the two partner groups trust each other. The first indicator directly assesses the level of trust between the groups, through a general assessment. The second indicator is a multiplicative assessment that evaluates the reputation of each group for meeting its commitments.

Mutual Trust Indicator 1: (General Assessment, **Mean 5.4509**; SD 0.8620; Range 4)

A4/B4. The level of trust that exists between the [Manufacturing] group and the [Quality or R&D] group is:

A4: **Mean 5.54464**; SD 1.10599; Range 5

B4: **Mean 5.35714**; SD 0.92860; Range 4

Mutual Trust Indicator 2: (Multiplicative Assessment, **Mean 28.304**; SD 8.374; Range 43)

The product of the responses to the following:

A5: The reputation of the [Quality or R&D] group for meeting its commitments to the [Manufacturing] group is: **Mean 5.44643**; SD 0.96646; Range 4

B5: The reputation of the [Manufacturing] group for meeting its commitments to the [Quality or R&D] group is: **Mean 5.13393**; SD 0.97256; Range 6

Mutual Trust Construct: The mean of the above indicators, **Mean 16.877**; SD 4.452; Range 21.5.

Mutual Influence*

The three indicators of mutual influence assess the level of influence and the ability to affect that members of the groups have on each others' key decisions and policies. The first indicator directly assesses the level of influence and the ability to affect between the groups, through a general assessment. The second indicator is a multiplicative assessment that evaluates the level of influence that the members of the groups have on each other's key decisions and policies. The third indicator is a multiplicative assessment that evaluates the ability to affect that the members of the groups have on each other's key decisions and policies

Mutual Influence Indicator 1: (General Assessment, **Mean 4.8973**; SD 0.7478; Range 3.75)

The average of the responses to the following:

A6/B6. In general, the level of influence that members of the [Manufacturing] Group and the [Quality or R&D] have on each other's key decisions and policies is:

A6: **Mean 5.01786**; SD 0.97705; Range 5

B6: **Mean 4.85714**; SD 0.98509; Range 5

A7/B7. In general, the ability of members of the [Manufacturing] group and the [Quality or R&D] group to affect each other's key decisions and policies is:

A7: **Mean 5.00000**; SD 1.04838; Range 5

B7: **Mean 4.71429**; SD 1.06904; Range 5

Mutual Influence Indicator 2: (Multiplicative Assessment, **Mean 22.089**; SD 7.986; Range 33)

The product of the responses to the following:

A8: In general, the level of influence that members of the [Quality or R&D] group have on key decisions and policies of the [Manufacturing] group is:

Mean 4.81250; SD 0.92543; Range 4

B8: In general, the level of influence that members of the [Manufacturing] group have on key decisions and policies of the [Quality or R&D] group is:

Mean 4.50893; SD 1.17017; Range 6

Mutual Influence Indicator 3: (Multiplicative Assessment, **Mean 22.911**; SD 7.905; Range 33)

The product of the responses to the following:

A9. In general, the ability of members of the [Quality or R&D] group to affect key policies and decisions of the [Manufacturing] group is:

Mean 4.93750; SD 0.84129; Range 3

B9. In general, the ability of members of the [Manufacturing] group to affect key policies and decisions of the [Quality or R&D] group is:

Mean 5.57143; SD 1.19845; Range 5

Mutual Influence Construct: The mean of the above indicators, **Mean 16.632**; SD 5.099; Range 22.750.

(*) Questionnaire items for shared knowledge, mutual trust and mutual influence used in our study had been validated and used by Nelson and Coopridge (1996) upon exploring the concept of shared knowledge between Information Systems (IS) groups and their line customers as a contributor to IS performance.

Information Technology and Sharing Knowledge (ITsk)

By means of the relationship questionnaires (Type A and B) we are measuring the role and level of contribution of IT in supporting shared knowledge. We, thus, use the marker (sk) to distinguish from the IT indicators used in the performance questionnaire.

ITsk Indicator 1: (Multiplicative Assessment, **Mean 27.732**; SD 8.514; Range 40)

The product of the responses to the following:

A.10: In general, the role and the level of contribution of Information Technology (IT) as a tool and/or enabler, in supporting shared knowledge between [Manufacturing] group and [Quality or R&D] group is: (**Mean 5.25893**; SD 0.8776; Range 4)

B.10: In general, the role and the level of contribution of Information Technology (IT) as a tool and/or enabler, in supporting shared knowledge between [Quality or R&D] group and [Manufacturing] group is: (**Mean 5.19820**; SD 1.10223; Range 5)

ITsk Indicator 2: (Multiplicative Assessment, **Mean 29.223**; SD 8.379; Range 33)

The product of the responses to the following:

A.11: In general, the use of the Information Technology (IT) infrastructure in the [Manufacturing] group is: (**Mean 5.21429**; SD 0.90473; Range 5)

B.11: In general, the use of the Information Technology (IT) infrastructure in the [Quality or R&D] group is: (**Mean 5.54128**; SD 0.95774; Range 4)

Information Technology and Sharing Knowledge Construct (ITskC): The mean of the above indicators, **Mean 28.478**; SD 7.601; Range 34.

2. **PERFORMANCE QUESTIONNAIRE** (Type C) included nine questions aiming to measure:
 - Operational manufacturing performance (3 questions)
 - Service manufacturing performance (3 questions)
 - The level of contribution of Information Technology (ITmp) to Manufacturing group performance (2 questions)
 - The use of IT functions –under the above described concept (1 question with multiple sub questions. Results are given in pie-chart form and are not presented here.)

The following questions ask you to compare the [Manufacturing] group to other such Manufacturing groups. In relation to other comparable groups you have observed, how does the [Manufacturing] group rate on the following:

Use Table 3 to measure constructs:

Table 3.

1	2	3	4	5	6	7
Non-Existent	Very Weak	Weak	About Average	Strong	Very Strong	Extremely Strong

Manufacturing Performance

The indicators used to measure the two constructs of manufacturing performance in our study, are given in detail, here below. For reasons related to our initial study, we treated the answers separately (A for Manufacturing and B for Quality or R&D stakeholders), although this does not affect results here. As in approximately 95 per cent of the manufacturing units under investigation, the two stakeholders that completed the performance questionnaire were related, one to Production and the second to Quality or R&D (in most cases Production or Quality Directors) we have used multiplicative assessments of interaction for the questions relating manufacturing performance to collaboration among the groups.

A. Operational Manufacturing Performance

Operational MP Indicator 1: (Multiplicative Assessment)

The product of the two stakeholders' responses (from Manufacturing and Quality or R&D) to the following:

C1. In general, the quality of the work produced by the [Manufacturing] group for the [Quality or R&D] group is:

CA1: **Mean 5.29464**; SD 0.77852; Range 4

CB1: **Mean 5.50000**; SD 0.69749; Range 3

Operational MP Indicator 2: (General Assessment)

The average of the responses to the following:

C2. In general, the ability of the [Manufacturing] group to meet its organizational commitments (such as project schedules and budget) is:

CA2: **Mean 5.33929**; SD 0.87563; Range 5

CB2: **Mean 5.33929**; SD 0.72972; Range 3

Operational MP Indicator 3: (General Assessment)

The average of the responses to the following:

C3. In general, the ability of the [Manufacturing] group to meet its goals is:

CA3: **Mean 5.41964**; SD 0.74300, Range 3

CB3: **Mean 5.37500**; SD 0.77256; Range 3

Operational MP Construct: The mean of the above indicators, **Mean 13.385**; SD 2.641; Range 14.333.

B. Service Manufacturing Performance

Service MP Indicator 1: (Multiplicative Assessment)

The product of the two stakeholders' responses (from Manufacturing and Quality or R&D) to the following:

C4. In general, the ability of the [Manufacturing] group to react quickly to the [Quality or R&D] group's changing business needs is:

CA4: **Mean 5.29464**; SD 0.92647; Range 4

CB4: **Mean 5.41964**; SD 0.71834; Range 4

Service MP Indicator 2: (Multiplicative Assessment)

The product of the two stakeholders' responses (from Manufacturing and Quality or R&D) to the following:
C5. In general, the responsiveness of the [Manufacturing] group to the [Quality or R&D] group is:

CA5: **Mean 5.18750**; SD 0.92543; Range 4

CB5: **Mean 5.27027**; SD 0.79711; Range 4

Service MP Indicator 3: (Multiplicative Assessment)

The product of the two stakeholders' responses (from Manufacturing and Quality or R&D) to the following:
C6. In general, the contribution that the [Manufacturing] group has made to the accomplishment of the
[Quality or R&D] group's strategic goals is:

CA6: **Mean 5.41071**; SD 0.95441; Range 5

CB6: **Mean 5.25893**; SD 0.86728; Range 4

Service MP Construct: The mean of the above indicators, **Mean 28.591**; SD 7.294; Range 37.667.

Manufacturing Performance Construct: The mean of Operational MP and Service MP constructs, **Mean 20.988**; SD 4.658; Range 21.25.

Information Technology and Manufacturing Performance (ITmp)

By means of the performance questionnaire (Type C) we are measuring the role and level of contribution of IT in supporting the performance of the manufacturing group. We therefore use the marker (mp) to distinguish from the IT indicators used in the relationship questionnaires (Type A and B).

ITmp Indicator 1: (Multiplicative Assessment, **Mean 28.348**; SD 7.673; Range 41)

C.A7: In general, the level of the Information Technology (IT) Contribution to the [Manufacturing] group performance is: (**Mean 5.17857**; SD 0.91252; Range 5)

C.B7: In general, the level of the Information Technology (IT) Contribution to the [Manufacturing] group performance is: (**Mean 5.38393**; SD 0.72591; Range 4)

ITmp Indicator 2: (General Assessment, **Mean 5.3170**; SD 0.8383; Range 3.5)

CA/B8: In general, the use of the Information Technology (IT) infrastructure, among the three groups is: (**Mean 5.22321**; SD 0.94640; Range 4)

Information Technology and Manufacturing Performance Construct (ITmpC): The mean of the above indicators, **Mean 16.833**; SD 4.069; Range 21.75.

It is noticeable that no significant difference is observed between responders of questionnaires A and B, regarding questions C.1 to C.7. Questions CA/B.8, due to their nature, have been analyzed as one.

Appendix II: Regressions and Confirmatory Tests

General Note: Symbols used in our study and in the MINITAB extracts, included in the Appendixes, correlate as following:

β = Coef, $t = T$, $p = P$, $r = R\text{-Sq}$, $R^2 = R\text{-Sq}(\text{adj})$, and $F = F$.

ANOVA Table symbols:

DF=Degrees of Freedom, SS=Sums of Squares, MS=Mean Squares (SSR=SS Residual, SSTO=SS Total)

First Regression: MPC vs (MTC, MIC, SKC, ITmpC)

The regression equation is

$$\begin{aligned} \text{MPC=media (OMPC, SMPC)} &= 6.98 + 0.354 \text{ MTC=media (MT1, MT2)} \\ &- 0.0364 \text{ MIC=media (MI1, MI2, MI3)} \\ &+ 0.225 \text{ SKC=media (SK1, SK2, SK3)} \\ &+ 0.259 \text{ ITmpC=media (ITmp1, ITmp2)} \end{aligned}$$

Predictor	Coef	SE Coef	T	P	VIF
Constant	6.981	1.873	3.73	0.000	
MTC=media (MT1, MT2)	0.3535	0.1136	3.11	0.002	2.1
MIC=media (MI1, MI2, MI3)	-0.03643	0.08470	-0.43	0.668	1.5
SKC=media (SK1, SK2, SK3)	0.2248	0.1034	2.17	0.032	2.3
ITmpC=media (ITmp1, ITmp2)	0.25948	0.09151	2.84	0.005	1.1

S = 3.72201 R-Sq = 38.5% R-Sq(adj) = 36.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	926.38	231.60	16.72	0.000
Residual Error	107	1482.31	13.85		
Total	111	2408.69			

Source	DF	Seq SS
MTC=media (MT1, MT2)	1	730.61
MIC=media (MI1, MI2, MI3)	1	12.91
SKC=media (SK1, SK2, SK3)	1	71.49
ITmpC=media (ITmp1, ITmp2)	1	111.38

Unusual Observations

Obs	MTC=media (MT1, MT2)	MPC=media (OMPC, SMPC)	Fit	SE Fit	Residual
38	15.3	28.083	19.417	0.619	8.666
58	8.0	9.250	17.651	1.010	-8.401
59	18.0	13.583	22.143	0.849	-8.559
107	20.8	18.917	23.830	1.523	-4.913

Obs	St Resid
38	2.36R
58	-2.35R
59	-2.36R
107	-1.45 X

R denotes an observation with a large standardized residual.

X denotes an observation whose X value gives it large influence.

Second Regression: SKC vs (MTC, MIC, ITskC)

The regression equation is

$$\text{SKC}=\text{media}(\text{SK1}, \text{SK2}, \text{SK3}) = 1.08 + 0.639 \text{ MTC}=\text{media}(\text{MT1}, \text{MT2}) \\ + 0.258 \text{ MIC}=\text{media}(\text{MI1}, \text{MI2}, \text{MI3}) \\ + 0.101 \text{ ITskC}=\text{media}(\text{ITsk1}, \text{ITsk2})$$

Predictor	Coef	SE Coef	T	P	VIF
Constant	1.078	1.594	0.68	0.500	
MTC=media (MT1,MT2)	0.63865	0.08285	7.71	0.000	1.3
MIC=media (MI1,MI2,MI3)	0.25800	0.07177	3.59	0.000	1.3
ITskC=media (ITsk1,ITsk2)	0.10137	0.04486	2.26	0.026	1.1

S = 3.38672 R-Sq = 58.4% R-Sq(adj) = 57.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	1739.43	579.81	50.55	0.000
Residual Error	108	1238.74	11.47		
Total	111	2978.17			

Source	DF	Seq SS
MTC=media (MT1,MT2)	1	1496.66
MIC=media (MI1,MI2,MI3)	1	184.22
ITskC=media (ITsk1,ITsk2)	1	58.56

Unusual Observations

Obs	MTC=media (MT1,MT2)	SKC=media (SK1, SK2, SK3)	Fit	SE Fit	Residual
3	17.5	9.333	16.556	0.763	-7.222
10	21.5	30.333	23.139	1.005	7.195
13	23.8	17.833	25.144	0.603	-7.311
42	15.0	23.833	16.661	0.578	7.172
48	15.5	16.167	16.116	1.227	0.051
58	8.0	14.167	11.786	1.121	2.380
64	17.3	10.000	20.044	0.461	-10.044
68	10.5	6.667	13.650	0.561	-6.984
74	21.5	15.333	24.367	0.585	-9.034
107	20.8	25.833	18.535	1.201	7.299

Obs	St Resid
3	-2.19R
10	2.22R
13	-2.19R
42	2.15R
48	0.02 X

58	0.74 X
64	-2.99R
68	-2.09R
74	-2.71R
107	2.30RX

R denotes an observation with a large standardized residual.

X denotes an observation whose X value gives it large influence.

Confirmatory Tests

1 Cronbach's *alphas*

Have been calculated, for all variables involved, according to the formula:

$$\alpha \equiv \frac{n}{n-1} \left[1 - \frac{\sum \sigma_{\chi_i}^2}{\sigma_x^2} \right]$$

Where for the variable: $\chi_1, \dots, \chi_i, \dots, \chi_n$

$\sigma_{\chi_i}^2$ = variance of χ_i and σ_x^2 = variance of $x = \sum \chi_i$

Shared Knowledge (SKC) = 0.9980971

Mutual Trust (MTC) = 0.99893219

Mutual Influence (MTC) = 0.99789307

Information Technology (ITskC) = 0.78191053

Information Technology (ITmpC) = 0.99919877

Manufacturing Performance (MPC) = 0.99870396

Operational Manufacturing Performance (OMPC) = 0.99935936

Service Manufacturing Performance (SMPC) = 0.81379442

2 MTMM Correlation Matrix

Correlations: MT1; MT2; MI1; MI2; MI3; SK1; SK2; SK3; OMPC; SMPC; ITskC; ITmpC

	MT1	MT2	MI1	MI2
MT2=A5*B5	0.682			
MI1=media (MI	0.574	0.478		
MI2=A8*B8	0.260	0.327	0.691	
MI3=A9*B9	0.371	0.493	0.7370	.714
SK1=media (A1	0.581	0.612	0.583	0.400

Sharing Scientific and Social Knowledge in a Performance Oriented Industry

SK2=A2*B2	0.608	0.569	0.485	0.375
SK3=A3*B3	0.612	0.650	0.603	0.373
OMPC=media (C	0.524	0.486	0.515	0.301
SMPC=media (C	0.457	0.506	0.477	0.163
ITskC=media (	0.279	0.287	0.338	0.156
ITmpC=media (	0.057	0.247	0.262	0.319
	MI3	SK1	SK2	SK3
SK1=media (A1	0.464			
SK2=A2*B2	0.449	0.597		
SK3=A3*B3	0.574	0.7670.603		
OMPC=media (C	0.390	0.448	0.448	0.532
SMPC=media (C	0.303	0.395	0.351	0.490
ITskC=media (	0.335	0.348	0.273	0.407
ITmpC=media (	0.217	0.208	0.197	0.233
	OMPC	SMPC	ITskC	
SMPC=media (C	0.691			
ITskC=media (	0.390	0.281		
ITmpC=media (	0.471	0.284	0.460	

Chapter 14

Social Knowledge: The Technology Behind

M. Chethan

Triumph India Software Services Pvt Ltd., India

Mohan Ramanathan

Triumph India Software Services Pvt Ltd, India

ABSTRACT

Every now and then a technology appears that changes or speeds up the development of civilization in a new direction. It started with agriculture, spread through the Industrial Revolution and to the electronic age and now moved on to a state of technology that people would have laughed at a few decades ago. Social networks have changed the way people connect, redefining the knowledge value system that is being shared without borders or limits. The multitude of science and technology that go behind building the social networks spans across mathematics to engineering to software and ultimately to the realms of psychology and sociology once thought as distantly removed from any application of technology. In this write up, we explore the convergence of many ideas and innovations and the technology that is building these networks.

INTRODUCTION

When a civil war broke out in the island of Mindanao, at the southern tip of the Philippines, as in any civil war, the sufferers were the citizens and in this case around 18 million remained without recourse to justice or human rights. Then came a technology solution to human rescue in the form of Martus (Benetech, 2009), a social network that helps watchdog groups compile, analyze, and

securely transmit data on human-rights abuse. Named after the Greek word for witness, Martus allows anyone to report human rights violations through its network. Today this model has been successfully replicated in countries like Burma, Columbia, and Srilanka, Guatemala etc.

Social networks are an integral part of our lives today and it is something that we have taken for granted. I spoke to my son, thousands of kilometers away in a different country and time zone and chatted about what he had for dinner while I was having my breakfast. I shared a few jokes

DOI: 10.4018/978-1-60960-203-1.ch014

and banalities with my 10 year old niece living in another city with equal ease. While mobile phones brought in the communication revolution, social networks brought in another paradigm to our connectivity and relationships. Social networks are everywhere, used by people of every age.

It was not so long ago that science or technology was considered poles apart from sociology or arts. This year is the 50th anniversary of C.P. Snow's (Robert Whelan, 2009) famous 'Two Culture' essay where he has pondered over the great cultural divide between science and arts. I am sure he would be greatly amused when he finds out that social networks are built with complex mathematical algorithms and technology. One main reason is the belief that thinking is irrational and cannot be manipulated using science. No one would believe that it was possible to predict the election results with sufficient accuracy until psephology became commonplace. If you are an Asimov (Wikipedia, 2010) fan like me, you may remember Hari Seldon's theory in the 'The Foundation' series of books, where he postulates that while an individual's future is difficult to predict, you can predict the future of a group or a crowd. Are we there already? (Chaoming Song, 2010) While a mathematical formula for Hari Seldon's theory is still far away, the law of Regressions to the Mean is equally fantastic. Multiple studies and research works are underway to define the mathematical formulae for 'flock mentality' and how a single person's opinion could start a butterfly effect and create a tornado. Not long ago even Science and Technology were considered two distinct worlds. Science was seen as an individual pursuit and education was not considered as a necessary pre-condition for a career in Science. We have all read about Faraday or Einstein, who worked in non-scientific institutions before they hit on a big idea. The man who built the longest rail road in the US was an illiterate for all practical purposes. It was Rutherford who has been credited with having built the first research team of scientists. The chemical industry was again the first to catch onto the connection between science and technology

and build commercially viable ventures. Soon, other branches of science followed. The Pharma industry took to it very recently, about 50 years back, to harness the research activity and thereby create an industry.

By definition, social networks connect individuals or groups over a common platform. Once connected, the human tendency to share information or chat (talk?) trivia becomes the driving force, creating a mind-boggling amount of information and traffic. This calls for technology that can provide a sufficient, scalable and secure bandwidth. Evolving technology such as cloud computing can only help to expand the horizon to reach out faster and in a safer way.

SOCIAL TECHNOLOGY

One of the pioneering works was conducted by Travers and Milgram in the late 1960s when they wanted to find out, how randomly selected individuals from one city could reach someone unknown to them in another city. To their surprise they found that within six steps or hops anyone could reach anyone else totally unconnected. This theory, which is now popularly known as six degrees of separation (Wikipedia, Six degrees of separation, 2010), became the basis for a social search to get connected to someone with the same interest. The advent of computer networks and the internet have pushed this evolution along dramatically. Thousands of tools such as email, instant messenger, blogs etc., have pushed social technology to what it is today. LinkedIn started with the premise that recommendations work better when they are given by someone who is one or two steps removed from your direct contact as otherwise the recommendation may be viewed as biased.

According to Jagadish Vashista Managing Director, Injoos, the realization that collaboration has taken another fundamental shift with the advent of social media tools (web2.0) led them to create the Injoos Teamware platform.

Businesses can improve with social linkages that employees build over a period of time for sharing and capturing knowledge. It is a well-known fact that the best possible information is provided by someone who knows you well and is aware of your context. Such platforms have the ability to accelerate innovation in enterprises and also bring about greater transparency.

In the initial phase many of them evolved as applications for closed groups and experts to help with their decision making. Social networking gained popularity as a simple means to get connected, mainly by teenagers. Now and then we read about a college kid who created a location-finder to keep track of his friends and how this concept grew to be a popular technology that helps people keep track of their locations and movements. Today, social networks go beyond just staying in touch. Social networking has been in existence in various forms for many years, but it is only in the last decade that the social networking boom has really taken off.

In no time, many of the applications that started as games became social network sites, simulations such as Second Life became popular networks.

SOCIAL NETWORK EXAMPLES

Social networking technology has evolved along a remarkable course over the past years. It has acquired an expanded range of meanings as a result of Facebook, Myspace, Twitter and other social utilities. These sites are popular mainly because of their socially demanding features like: User Created Content (UCC)/User Generated Content (UGC), comments, tagging, social networking, user interface, customization, RSS feeds etc. Social networking has become relatively familiar among the different sections of society as it is used to describe web services, which gets its content from users and aggregates its content from different site feeds. Here, we can call every individual a content producer and user who is

sending messages or posting content on websites as a publisher.

Let us look at some of the popular social networks, the technology employed in these and where will they lead to. The purpose and benefits of social networking are endless. Many interesting applications are possible in every field from education to health care for the aged. Social networks form opinions, create decision trees, share experiences, teach culture and tradition, and so on. Social networks fall into few easily identifiable types.

The social networks can be broadly classified as tools for communication, multimedia sharing, and collaboration and for building communities.

Communication Tools

- **Blogs (wordpress.org, blogger.com, technorati.com):** a tool to show up individual views, post entries or just comment on a published article.
- **RSS Feeds & Aggregators (bloglines.com/, www.feedreader.com/, www.myRSStoolbar.com):** feeds allow people to automatically keep up with updates and an aggregator is a piece of software that helps read the information in RSS feeds.
- **Microblogging (www.twitter.com, www.plurk.com):** a form of blogging where users send brief text updates.

Multimedia Sharing Tools

- **Photo Sharing (www.flickr.com, www.snapfish.com):** an online photo sharing tool.
- **Podcasts (odeo.com, podomatic.com/):** Digital media files that are distributed over the internet.
- **Vodcasts / Video sharing (www.youtube.com/, www.dailymotion.com):** websites or software that allow users to easily update and share their own video content.

Collaboration Tools

- **Wikis (wikipedia.com/, bluwiki.com,pbwiki.com/):** a webpage or a set of web pages that allow any user to easily create, edit and link content.
- **Courseware and Collaborative Software (www.sakaiproject.org/, whiteboard.sourceforge.net/, docs.google.com/):** refers to software designed for educational use and is often an online application, either free or paid for.

Community Tools

- Mainly deal with Social Networking (www.myspace.com, facebook.com, www.ning.com, www.linkedin.com). Social networking sites allow users to share information and connect with people of similar interests or social/professional connections.

Among the available social sites, the most popular ones are (Microgeist, 2009) {link to statistic}: Twitter – a leader in Microblogging, Digg – Leading site in bookmarking, Youtube - a leader in video sharing, Flickr – a leader in photo sharing, LinkedIn for professionals and Facebook to get fully social. These sites come under a different kind of social media service which have been categorized into different genres (Sirkkunen, 2008) like content creation and publishing (blogs, v-blogs, podcasts), content sharing (Flickr, YouTube, del.icio.us, Digg.com), social network sites (LinkedIn, Facebook, Match.com, Friendster, MySpace, IRC-Galleria), collaborative productions (OhmyNews, Wikipedia), virtual worlds (Second Life, Habbo Hotel), and addons (RockYou, Slide, Friends For Sale).

Today, social media tools are no longer used only for socializing or chatting but are also used in large organizations to improve information sharing among employees, for driving innovation, easy

information access, building networks, improving professional relations with other companies, outsourcing and now the most popular purpose i.e., crowdsourcing. Also, the socially aware and internet savvy people use social networking sites to (Dube, 2009):

- Find information related to finance, family etc,
- Create formal or informal networks with businesses and clients
- Attend virtual classrooms to get online degrees or certifications
- Get connected with other hobbyists who share the same interest
- Carry out experimental study, scientific or academic collaboration and research
- Gather required information and spread it? across the global community.

Online communities can be categorized into informational, professional, educational, hobbies, academic, and news related (Dube, 2009).

Informational

Informational communities mainly consist of people seeking answers to day-to-day problems. These are often linked to businesses like banks, retailers, and other companies that use social networks as a way to interact with customers. For example,

- HGTV Discussion Forums (<http://boards.hgtv.com>),
- Forbes Stock-Picking Community (<http://stocks.forbes.com>), and
- Do-It-Yourself Community (<http://www.diychatroom.com/>)

Professional

A professional social network helps its users to advance in their career or industry.

- LinkedIn Business Network (<http://www.linkedin.com>),
- SixApart Professional Blogging Community (<http://www.sixapart.com>) and
- Canon Professional Photographer Community (<http://cpn.canon-europe.com>).

Educational

Educational networks are platforms that many students visit in order to collaborate with other students on academic projects, to conduct research for school, or to interact with professors and teachers via blogs and classroom forums. For example,

- The Student Room - A UK based student community (<http://www.thestudentroom.co.uk>),
- The Math Forum - for math students – (<http://mathforum.org/students/>), and
- ePALS School Blog – to promote world peace (<http://sites.epals.com/cpauchnick/>).

Hobbies

One of the most popular reasons that many people use the Internet is to conduct research on their favorite projects or topics of interest related to personal hobbies. Some examples of websites which focus on specific hobbies are:

- GardenWeb (<http://www.gardenweb.com>),
- Automotive Forums (<http://www.automotiveforums.com>), and
- Sports Pundit (<http://www.sportspundit.com>).

Academic

Social networks are an obvious benefit for academic researchers. Here are few website links:

- OVID-Health Research (<http://www.ovid.com/site/community/index.jsp?top=21>),

- Connotea Collaborative Research (<http://www.connotea.org>), and
- Postgenomic Science Blogs (<http://www.postgenomic.com>).

News

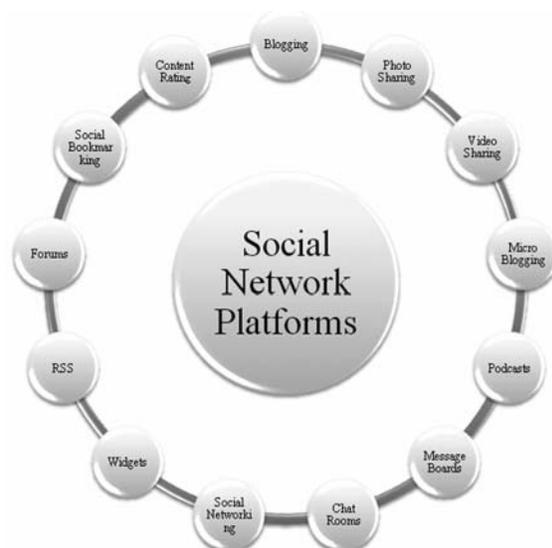
This type of social network is used to publish community content. These are large content websites where members are allowed to publish news stories, commentary etc. For example,

- Associated Content (<http://www.associatedcontent.com/>),
- Helium (<http://www.helium.com/>), and Suite 101 (<http://www.suite101.com/>).

Social networks are also classified into work networks, innovation networks, expert knowledge networks, career networks, learning networks etc.

Social Networking Platforms

Figure 1. Social networking platforms



TECHNOLOGY ISSUES

Building social networks requires an understanding of multiple technologies. Bandwidth optimization, scalability, security, usability, stability, database interfaces, analytical tools and mathematical algorithms are all important issues that need to be adequately addressed. Social networks have become a real power that drives people on the web. Many social networking websites have millions of users and some even count their user base in tens of millions. A significant example is Facebook that has around 300 million users.

“Social media is not just going to be in pure-play sites like MySpace and Facebook. It’s going to become increasingly prevalent across retailers, media and entertainment. It drives a lot more requests and a lot more bit-traffic across these networks”, says Mike Afergan, CTO of Akamai (Afergan, Mike (CTO of Akamai), 2008) a content delivery network company that supports MySpace, Facebook and Friendster. The huge amount of traffic and data that social networks handle pose new challenges, which must be met to keep providing useful and popular service to their users.

As social networks have become a global affair, any downtime they have will affect their users no matter what time of the day it is. “One of the things we’re hearing more and more from carriers is that social-networking sites like MySpace and YouTube are contributing to an exponential increase in DNS traffic,” says Tom Tovar (Tom Tovar, (president and COO), 2008), which sells high-end DNS software to carriers and enterprises. Social networking sites are creating large volumes of DNS traffic because most of the sites pull content from across the web. Many of these websites use content-delivery networks that extend the geographical reach of their content and enable users to access content easily from their homes. Sites like Facebook not only consume a lot of bandwidth, they also generate additional DNS lookups.

BANDWIDTH

According to Gartner (Gartner, 2008), “Ultra-high speed residential broadband will create a **bandwidth divide** that will emerge in the next three to five years, with urbanized areas benefiting from faster download speeds while rural areas will not”. Rapid downloading and live streaming of movies and television shows will be key drivers encouraging consumers to pay more for ultra-high speed broadband Internet services and distribution of user generated content through e-mail, social network sites, and video-sharing web sites will also increase demand for ultra-broadband. Till date, Myspace, Facebook, and YouTube are the bandwidth eaters because of music downloads, massive number of photos, and graphics for every user page. On the other side, a text-based social network like LinkedIn is consuming far less bandwidth per user. A poll of office workers conducted by Global Secure Systems (GSS) (anderson, 2008) (in association with the organizers of the Infosecurity Europe 2008 conference) indicates that large amount of network bandwidth is consumed by employees during work time in social networking activities. Mike Afergan, (Afergan, Mike (CTO of Akamai), 2008) says “Social networking sites affect network utilization in two ways: the profile-based sites like MySpace generate a lot of requests per user for small files, while the video-based sites like YouTube demand a lot of bandwidth for large video files to be transmitted across the network.

Pingdom (Pingdom, 2008), an uptime monitoring service provider conducted a survey on the world’s 15 largest social networks available in the year 2008. The survey result includes analysis of the accumulated downtime of each social network over the entire year:

- Facebook and MySpace, the two “giants” in this test, both had very little downtime in 2008.

- Only 5 social networks managed an overall uptime of 99.9% or better: Facebook (99.92%), MySpace (99.94%), Classmates.com (99.95%), Xanga (99.95%) and Imeem (99.95%).
- 84% of Twitter's downtime happened during the first half of 2008. However, the site availability saw a big improvement starting July 2008.
- LinkedIn's downtime increased over the year. Each quarter saw a larger amount of downtime than the one before it. 63% of its downtime took place during the second half of 2008.

SCALABILITY

This is an issue for anyone who introduces something new online and wants to grow. Some reasons involving more downtime can be scalability issues due to the growth of the user base, or the switch to a different service provider. High availability or uptime is important to all websites, and if they have more users, then there are more chances of getting affected by downtime issues. And reasons for improved uptime (less downtime) may be that sites are going for newer, more stable technologies, or switching to a different service provider. Above all, there are continuous challenges that any social network has to deal with. There are more reasons in addition to pure size as to why uptime really matters to social networks (Pingdom, 2008), like, Frequent usage, Global user base – increasing due to different global timings, Site Reputation, User Retention, Dependent Third Parties.

USABILITY

Usability is important because it is what draws people repeatedly back to a site. Traditional user experiences were used to measure things like speed of use, ease of remembering, where to

find something, how often errors were made, and overall user satisfaction. Many of these are valid measurements for some websites but are inappropriate for socially driven online experiences. According to *Nixon McInnis* (Ashwell, 2008) “Great **social media** usability is concerned with the success of the community – sometimes at the expense of the individual. This can't be tested very easily before launch so be ready to monitor, test and make improvements”. Unlike e-commerce sites where the users stay online only for a short time or for a few transactions, social media tools are a regular activity and will not end after one or two times. Some social media sites with good usability are (Ashwell, 2008):

Geni

- Popular due to features like easy registration, simple layout with a non-distracting background, small number of fields, useful comments, ‘Start my tree’ button
- Make it as easy as possible for users to interact and participate. Ideally, this means no registration or log-in.
- If any part of the process is difficult or ambiguous, many users may see it as an indication of what is to come and leave the site
- Seamless registration, on the other hand, brings happy, relaxed users into your network that is ready to get involved
- Simple layout with a non-distracting background
- Useful comments that appear where you need them

LinkedIn

- For stickiness due to its progress bar, personalizing homepage, email updates
- Progress bar encourages members to add more information
- Invite your existing email network and so build up your LinkedIn network

Social Knowledge

- Make the space more useful by personalizing your homepage or adding applications
- See useful information added by other LinkedIn members
- Receive email updates about the people in your network
- The play theme is also encouraged as the more time a user spends on the site the more features they will find and awards prizes to good photos

Flickr

- For photo sharing because it is simple, creates fun pictures, uses photos to make mini-cards or greeting cards, ‘Show me the kittens!’ feature, and explores images geographically.
- Encourages users to join and stick around are the things you can do with all the photos like share, comment, tag, rate, add to maps, and make contacts

TECHNOLOGIES: WHICH ONE TO CHOOSE?

Someone interested in designing a social networking site is often stuck with the problem of too much choice. PHP, JAVA and ROR (Ruby on Rails) are just some of tools that can be used to build websites, and choosing amongst them can be difficult. (jian, 2009). To decide on which tool to use, some of the important criteria are:

Figure 2. Requirements to build social networks

Technical Requirements (With reference to PHP)	Social Networks - Feature List	Building social Networks - Sites with/without software
Social Networking software is installed online on actual server. It can be a dedicated server, shared server or virtual server.	<ul style="list-style-type: none"> • User Registration • Profile • Wiki, Groups, Polls & Forum • Search People & Make Friends • Privacy setting • Photos • Videos • Messages/Text boxes • Classifieds/RSS feeds • Blogs, Comments, Rating, Tagging and Sharing • Rewards and Point System • Auto Responders • Chat • Twitter type activity Events • Admin (Full Control) • Portraits / Avatars 	<p>Following are free baseline services:</p> <p>Ning, KickApps, CrowdVine, GoingOn, CollectiveX, Me.com, PeopleAggregator, Haystack, and ONEsite.</p> <p>Creating your own social network (some paid ones).</p> <p>BuddyPress, Pligg, Drupal, Elgg, Dolphin, Joomla.</p> <p>Others: Affinity Circles, AistraSoft, Blogtronix, Boonex, Broadband Mechanics, Converdge, Crowd Factory, DZOIC, GoLightly, introNetworks, Kwiqq, Leverage, Lithium, LiveWorld, Neighborhood America, Omnifuse, Pringo, Prospero, SelectMinds, Small World Labs, Social Platform, Sparta Social Networks, Telligent, ThePort, Awareness, VMIX Media, Web Crossing, Web Scribble Solutions, and Webligo.</p>
Linux Server with disk space 1 G.B + Adequate bandwidth		
PHP – (PHP 5.0)		
MySQL 5.0 or better		
Zend Optimizer for enhancing the performance of PHP apps		
ImageMagick or GD2 (PHP module) for high-quality thumbnails producing.		
Cron Job Editor - email alerts.		
phpMyAdmin		
Chat Plugin Requirements – AJAX (Requires large server)		
Video Plugin Requirements- YouTube embedding or configure PHP FFMPEG		

- Learning Curve
- Scalability
- Development speed
- Maintainability
- Availability.

This allows us to pick the appropriate web application language/framework. For example, PHP is easy to learn and faster to deploy irrespective of the platform. And although ROR supports dynamic typing, it is easier than Java. As far as scalability and availability are concerned, PHP is the most compatible and can run on dedicated servers, VPS's or shared hosts whereas Java and Ruby are rarely able to run on shared hosts. In terms of development speed, Ruby on Rails is the fastest, although PHP is also a good choice due to the presence of quick development frameworks

like CakePHP. Finally, when we compare these languages/frameworks in terms of maintainability, Java and Ruby are both very good but PHP scripts can become difficult to maintain.

ADVANCED TECHNOLOGIES FOR SOCIAL NETWORKS

Cloud computing is an emerging computing technology which uses the internet and central remote servers to maintain data and applications. **Cloud computing** (wolf, 2009) and social networks are two main powerful mantras in the current web scenario. Salesforce.com recently rolled out their *service cloud*, a customer service application that uses crowdsourcing to acquire books of knowledge floating across the web from sites like Google,

Figure 3. Social statistics and technology

Sites	Statistics	Technology
Wikipedia	(Wikipedia, 2009) 10,675,775 registered users; 18,052,875 pages http://en.wikipedia.org	PHP + MySQL MediaWiki
Facebook	(Facebook, 2009) Over 300 million active users; average user has 130 friends Mobile: More than 65 million active users www.facebook.com	PHP + MySQL
Twitter	More than 4,313,318,500 Tweets till date (Reed, 2009). 86,078 – number of followers of the most active user (@kevinrose) www.twitter.com	Ruby on Rails, UI designed using Omnigraffle and Photoshop
LinkedIn	September 2009, LinkedIn (LinkedIn, 2009) has over 47 million members in over 200 countries and territories around the world.	Java technology and Agile practices
MySpace	www.myspace.com	Win2003 server + IIS 6.0+ asp.net + SQL server 2005
Youtube	June 2009 – According to Comscore (comScore, 2009), in US 107.1 million viewers watched 6.8 billion videos on YouTube.com (63.5 videos per viewer). www.youtube.com	Apache, Python, Linux, MySQL, lighthttpd for video
Digg	236,000,000 – number of visitors attracted annually by 2008 (according to a Compete survey) (scherstech, 2009) www.digg.com	MySQL, Linux, PHP, Python, APC PHP Accelerator, Apache, Mcache

Facebook and Amazon, and uses this information to improve commercial customer service transactions. Salesforce.com has now connected Twitter, the microblogging site, to their service cloud, allowing service representatives using the Software as a Service (SaaS) to view tweets from global twitter users.

Service Oriented Architecture (SOA) is often used in combination with web services. Social networks are always termed as an ideal example for SOA implementation. *Miko Matsumura* (Miko Matsumura (deputy CTO, SoftwareAG), 2009) says “The whole social network becomes sort of inextricably linked to the evolution of SOA. Without the ability to evolve agreement you cannot even create solutions.”

Social network analysis (SNA), as the name says, is nothing but analyzing the different social networks, by measuring the flows or relationships between people, groups, organizations, computers, URLs, and other connected information/knowledge entities. SNA helps us to get the visual and mathematical analysis of human and network relationships.

Second Life (abbreviated as SL) is an Internet-based virtual world. Second Life is a free online virtual world imagined and created by its Residents to interact with each other through motional avatars, providing an advanced level of a social network service combined with general aspects of a metaverse. Residents can explore, meet other Residents, socialize, participate in individual and group activities.

Technology: Linden Script Language (LSL), JAVA, J2EE, XML- RPC.

Mashups are an exciting genre of interactive Web applications that draw upon content retrieved from external data sources to create entirely new and innovative services. The term mashup implies easy, fast integration, frequently using open APIs and data sources to produce results that were not the original reason for producing the raw source data.

Technology: API/content providers, mashup site, and the client’s Web browser - REST, Web

Services, and RSS/Atom, JavaScript, Google maps API.

OpenID is a free and easy way to use a single digital identity across the Internet. OpenID eliminates the need for multiple usernames across different websites, simplifying your online experience.

Technology: URI, HTTP, SSL, Diffie-Hellman algorithm

Folksonomy (also known as collaborative tagging, social classification, social indexing, and social tagging) is the practice and method of collaboratively creating and managing tags to annotate and categorize content. (Smith et al, 2008). Tool: Rollyo.com Technology: Web 2.0 services (Tagging, Annotation)

FUTURE OF SOCIAL NETWORKS/CONCLUSION

Social networking sites are experiencing an exponential growth in terms of new ideas, user groups and interesting applications, and are limited only by imagination. Organizations build their social networks to cater to many interesting applications ranging from improving the employees’ productivity to increasing customer satisfaction. We are heading towards the development of domain related social networks that can leverage this platform to great benefit. For example, a social networking platform for the medical field could lead to better sharing among medical professionals, patients, pharma companies, insurance providers and so on. When multiple groups interact, the information shared or sought is different for each group and these calls for better architecture, data management, security, usability etc.

Of course, the future could also see the social networks moving towards a pay per use platform. Or, just like MIT (Massachusetts Institute of Technology) opened its doors for everyone to download course syllabus through its open courseware platform, other institutes and organizations could follow suit and head towards free access

for content. Mobile phones are already being used for social networking. In the future we will most likely encounter uses of mobile phones we could not have dreamt of a few years ago. For example, technology is available today to collect information in real time from mobile phones, aggregate and display them back to mobile phone users. Such applications can range from road conditions, traffic density, weather or even flora and fauna. A mobile phone with an acceleration sensor could automatically sense when the driver slows down, use advanced algorithms to detect if it was because of a traffic signal or a road hump and transmit the information to a central server. A quick aggregation of this information could show the driver on the road the conditions ahead of time. A bird song picked up by a mobile can be sent to a query server to get complete information about the bird. With these, ornithologists can infer the density of specific birds in each locality without having to conduct a physical survey as they do now. To summarize, the future of social networks will be lean heavily towards *Distributed Information Collection*.

REFERENCES

- Afergan, M. (CTO of Akamai). (2008, March 8). How myspace is hurting your network. Retrieved from pcsympathy: <http://www.pcsympathy.com/2008/03/08/how-myspace-is-hurting-your-network/>
- Anderson, P. D. (2008, January 23). Social networking eats time and bandwidth (allegedly). Retrieved from Techlun: <http://techlun.ch/2008/01/23/social-networking-eats-time-and-bandwidth-allegedly/>
- Ashwell, L. (2008). This is a guide to social media usability for Marketers. In McInnes, N. (Ed.), *Social Media Usability*. Brighton: Nixon McInnes.
- Benetech. (2009, October 5). About Martus. Retrieved from Martus: <http://www.martus.org/>
- Chaoming Song, Z. Q.-L. (2010). *Limits of Predictability in Human Mobility*. Washington, DC: Science Mag.
- ComScore. (2009, June 4). Press Release. Retrieved from comScore: http://www.comscore.com/Press_Events/Press_Releases/2009/6/Americans_Viewed_a_Record_16.8_Billion_Videos_Online_in_April
- Dube, R. (2009, March). What Types of Social Networks Exist? Retrieved from Social Networking: http://socialnetworking.lovetoknow.com/What_Types_of_Social_Networks_Exist
- Facebook. (2009). Statistics. Retrieved from Facebook: <http://www.facebook.com/press/info.php?statistics>
- Gartner. (2009, September). Ultra Broadband to cause Bandwidth divide. Retrieved from Zdnetasia: <http://www.zdnetasia.com/news/internet/0,39044908,62057651,00.htm>
- Jian, H. (2009, March 22). HeJian E-Commerce Consultant. Retrieved from chr00t: <http://www.chr00t.com/2009/03/php-vs-java-vs-ruby/>
- Linkedin. (2009, September). About. Retrieved from Linkedin: <http://press.linkedin.com/about>
- Microgeist. (2009, April 27). The 10 Types of Social Media Sites You Need to be on and why. Retrieved from Microgeist: <http://microgeist.com/2009/04/the-10-types-of-social-media-sites-you-need-to-be-on-and-why/>
- Miko Matsumura (deputy CTO, SoftwareAG). (2009, March 20). Untangling ‘Rube Goldberg’ SOAs with Social Networking. Retrieved from ebizq: http://www.ebizq.net/blogs/soainaction/2009/03/soa_tribes.php
- Pingdom. (2008). Social network downtime in 2008 (www.pingdom.com). Sweden: Pingdom.

Social Knowledge

Reed, N. (2009, September 30). Gigatweet. Retrieved from popacular.com: <http://popacular.com/gigatweet/>

scherrtech. (2009, May 16). Internet, Mobile, Broadband & Social Media World Usage Statistics 2009. Retrieved from scherrtech: <http://www.scherrtech.com/wordpress/2009/05/16/internet-mobile-broadband-social-media-usage-statistics-2009/>

Sirkkunen, K. L. (2008). *Social media - Introduction to the tools and processes of participatory economy*. Finland: Tampere University Press.

Tovar, T. (2008, March). How MySpace Is Hurting Your Network. Retrieved from pcsympathy: <http://www.pcsympathy.com/2008/03/08/how-myspace-is-hurting-your-network/>

Vashista, J. (2009, September 30). Retrieved 9 30, 2009, from www.injoos.com.

Whelan, R. (2009, May 5). Fifty years on, CP Snow's 'Two Cultures' are united in desperation. Retrieved March 2010, from Telegraph.co.uk: <http://www.telegraph.co.uk/technology/5273453/Fifty-years-on-CP-Snows-Two-Cultures-are-united-in-desperation.html>

Wikipedia. (2009, September 27). Wikipedia: About. Retrieved from Wikipedia: <http://en.wikipedia.org/wiki/Wikipedia:About>

Wikipedia. (2010, March). Isaac Asimov. Retrieved March 2010, from Wikipedia: http://en.wikipedia.org/wiki/Isaac_Asimov

Wikipedia. (2010, March). Six degrees of separation. Retrieved March 2010, from Wikipedia: http://en.wikipedia.org/wiki/Six_degrees_of_separation

Wolf, I. (2009, March 23). Cloud Computing and Social Networks Merge into "The Service Cloud"...03.23.09. Retrieved from lonewolfbrarian: <http://lonewolfbrarian.wordpress.com/2009/03/23/cloud-computing-and-social-networks-merge-into-the-service-cloud032309/>

KEY TERMS AND DEFINITIONS

Annotation: An annotation is a summary made of information in a book, document, online record, video, software code or other information.

Bandwidth: In computer networking and computer science, bandwidth, digital bandwidth, or network bandwidth is a measure of available or consumed data communication resources expressed in bit/s or multiples of it (kbit/s, Mbit/s etc).

Crowdsourcing: Crowdsourcing is the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call.

Psephology: Psephology (from Greek psephos ψῆφος, 'pebble', which the Greeks used as ballots) is the statistical analysis of elections. Psephology uses compilations of precinct voting returns for elections going back some years, public opinion polls, campaign finance information and similar statistical data.

Six Degrees of Separation: Six degrees of separation (also referred to as the "Human Web") refers to the idea that, if a person is one step away from each person they know and two steps away from each person who is known by one of the people they know, then everyone is at most six steps away from any other person on Earth.

Social Media: Websites which build on Web 2.0 technologies to provide space for in-depth social interaction, community formation, and the tackling of collaborative projects.

Social Search: Social search or a social search engine is a type of web search method that deter-

mines the relevance of search results by considering the interactions or contributions of users.

Two Cultures: The Two Cultures is the title of an influential 1959 Rede Lecture by British scientist and novelist C. P. Snow. Its thesis was that the breakdown of communication between the “two cultures” of modern society — the sciences and the humanities — was a major hindrance to solving the world’s problems. As a trained scientist who was also a successful novelist, Snow was well placed to articulate this thesis.

Web Services: The term Web services describes a standardized way of integrating

Web-based applications using the XML, SOAP, WSDL and UDDI open standards over an Internet protocol backbone. XML is used to tag the data, SOAP is used to transfer the data, WSDL is used for describing the services available and UDDI is used for listing what services are available. Used primarily as a means for businesses to communicate with each other and with clients, Web services allow organizations to communicate data without intimate knowledge of each other’s IT systems behind the firewall.

Chapter 15

Empowering Social Knowledge with Information Technology: Technological and Cultural Issues Convergence

Fjodor Ruzic

Institute for Informatics, Croatia

ABSTRACT

Social knowledge is not a new category; however, in these times of information-communications systems maturity, it becomes an extremely important and valuable asset. In the context of social knowledge, information technology should be constantly harmonized with cultural milieu characterized mostly by invisible culture and its actions. The aim is to make the real and acceptable convergence of cultural and technological issues. Since the knowledge becomes social only with the communication process, it is deeply connected with the terms of media. Social knowledge is alike any media activity where two-tier principles is included consisting cultural (politics and social paradigm) and technological (information tools) issues. The real drawbacks of social knowledge based on information-communications systems that means the dependency on information technology, is about the continuity - the entire social knowledge base could be fragmented or even lost for future generations. The information/digital content keeping technologies are developed well, but the knowledge and invisible culture assets are under the special treatment if we want to make our social knowledge as the legacy for future generations.

INTRODUCTION

Knowledge is embedded in people gathered in communities and networks and all knowledge is broadly socially mediated and access to knowledge is by connecting to people that know. Thus, the knowing is an act of participation and is more

living process than solely acquisition of an object. Lasting knowledge denotes knowing more than definitions, concepts and relationships. It is sometimes feeling what is right in particular situation requiring personal engagement, passion and a community to emerge.

Knowledge is also presented as the act or state of knowing; clear perception of fact, truth, or duty; certain apprehension; familiar cognizance;

DOI: 10.4018/978-1-60960-203-1.ch015

cognition. Knowledge, which is the highest degree of the speculative faculties, consists in the perception of the truth of affirmative or negative propositions (Locke, 1689).

Knowing is an act of participation. Learning and knowledge require culture and tools (technology) that with communication make ecosystem for social knowledge. These issues correlates to the term of social mediation that is the key in helping us make meaning and gain understanding. The process of social activities supply shared meaning where every individual established its own cognitive world. New insights arise with the interactions of communities, connections and reflections where identity and meaningfulness are the wellspring of creativity. In fact, personal identity and context are keys in all forms of knowledge, and they determine engagement in dialog and control of behavior. Since community is prerequisite for continuous learning, knowledge needs negotiation mediated social values and reflection. It means that we must separate knowledge from personal knowing and individual competence and skills. Knowledge is situated into entire culture and is present in social actions, inventions, artifacts, etc.

It has been argued that organizational culture can be highly influenced by societal culture (Hofstede, 2001). People's organizational behaviors may be partly related to their attitudes, beliefs, and values, which may be affected by some cultural factors (Markus & Kitayama, 1991; Triandis, 1995). In addition, researchers and management theorists understand organizational phenomena based, in part, on some assumptions related to their societies' cultures (Hofstede, 1993). This suggests that aspects of some management theories and models, which have come from highly developed countries, may not be completely consistent with the cultural characteristics of other countries, and vice versa. This recognition has encouraged some researchers to examine management theories and models from cultural perspectives (for example, Management by Objectives, Maslow's Theory). It is of special interest for research in the context

of Internet and Web 2/Web 3 technologies that open up the communication space regardless real physical position of group, community and organization.

Knowledge

Knowledge has several synonyms connected in terminology with the terms of information, learning, erudition, lore, and scholarship. These nouns refer to what is known, as through study or experience. Knowledge is the broadest term, and there was a need to find systematical view of information base that builds knowledge corps. Thus, theory of science is organized knowledge (Spencer, 1929). Spencer also stated the knowledge as the scientific study of education, psychology, sociology, and ethics from an evolutionary point of view (Eiseman, 1973, p. 153).

The traditional definition of knowledge is 'justified true belief'. There are many problems with that definition, but it does point to the fact that we think of 'knowledge' as being something broadly mental and propositional. Knowledge, in other words, is a macro phenomenon, like an entire set of connections, and not a micro phenomenon, like a single connection of information nodes.

Knowledge per se, incorporates several meanings, all of them regarding individual state, action or process.

- a. The state or fact of knowing
- b. Familiarity, awareness, or understanding gained through experience or study
- c. The sum or range of what has been perceived, discovered, or learned
- d. Learning; erudition: teachers of great knowledge
- e. Specific information about something

The first hint of what knowledge is all about came from Locke (1689) who stated the Knowledge as the perception of the agreement or disagreement of two ideas. He views us as having

sense organs that when stimulated, produce ideas of sensation. These ideas of sensation, in turn, are operated on by our minds to produce ideas of reflection. Thus, ideas come to us via our senses, which in turn can be turned into new ideas via reflection. These two routes that ideas take are derived from experiences. Thus, we can have no knowledge beyond our ideas.

In *Democracy and Education* (1916), Dewey suggests that individuals incorporate a variety of frameworks of meaning into their everyday lives. These include the more familiar scientific or rationalized knowledge, but some frameworks might be called commonsense or second-hand knowledge. He contrasted empirical knowing, which is connected with everyday affairs, serving the purposes of the ordinary individual who has no specialized intellectual pursuit, with rational knowledge, which touches reality in intellectual fashion not debased by application in behavior. In characteristic pragmatic fashion, he states all knowledge as a combination of sensation, emotion, and thought. Obviously, the state and activity of an individual makes the node in social knowledge achievement.

There are two kinds of material ideas: simple and complex. Simple ideas have one attribute while complex ideas are compounds of simple ideas. Thus, there is a building block to ideas - they come to us via our senses, and in turn, we can reflect upon them to form complex ideas. With the help of information technology, the idea could be produced and evaluated faster and also with the Internet as a communication media, the idea is communicated faster and within greater number of individuals (nodes) making social knowledge more saturated.

Social Knowledge

In the process of collective thinking, there is a great impact of the mental models. Mental model briefly refers to those cognitive structures that are related to people's assumptions, beliefs, and

implicit theories about themselves, others, and events (Senge, 1990). It is also valuable to note that system thinking is of vital importance for knowledge core. It briefly refers to a holistic approach to identifying the dynamic relationships between different components of a phenomenon. Systems thinking should be practiced in teams rather than individually, because the effectiveness of systems thinking may highly depend on taking as many perspectives as possible into account (Senge et al., 1994).

Senge and colleagues (Senge, Kleiner, Roberts, & Ross, 1994), with respect to the mental model theory in cognitive psychology (Johnson-Laird, 1983) and the double-loop learning model (Argyris, 1982), suggested that people's mental models are important factors in forming individuals' decisions and actions that is crucial in the context of social knowledge developing process. In the process of making social knowledge producible by information technology, it is obvious that shared visions may improve collective actions in terms of people's commitments to their goals and organizational actions.

From the view of team, group, and organization, shared vision refers to developing shared images of the future and guiding practices by which people hope to achieve their desires (Senge et al., 1994). Some predicts (Schein, 1993; Senge, 1990) that Social Knowledge depends on various factors involved in its activity but there are several key enablers such as:

- Societal collectivism
- In-group collectivism
- Power distance
- Future orientation
- Assertiveness
- Human orientation

The term social knowledge came into usage in the late 1800s, during the professionalization of the social sciences. Though today the term primarily describes the product of academic and

professional social science investigations, in the nineteenth century it referred to collective practices that ordinary individuals and communities used to describe, explain, and understand social reality. Reacting against formal, a priori knowledge and seeking to illuminate the social bases of knowledge, Progressive Era social theorists offered a nascent articulation of social knowledge as a theoretical term, pointing to the social processes by which widely shared ideas, beliefs, and values shaping common explanations of society are forged.

Knowledge in the social context means human faculty resulting from interpreted information - understanding that evolves from combination of data, information, experience, social activities, and individual interpretation. These categories make the group of things that drives human to action in a society or in an organization. In an organizational and social context, knowledge is the sum of what is known, and what resides in the intelligence and the competence of people. In recent years, knowledge has come to be recognized as a factor of production in its own right, and distinct from labor making useful paths to the knowledge economy.

In the context of the social knowledge evolution, it is needed to cope with the term of the knowledge economy, popularized by management theorist Drucker (1959), who preferred the phrase knowledge to information, even when information was more fashionable, (as in information society, information systems, information technology). Knowledge is now prevalent (chief knowledge officer, etc) following the rhetorical devaluation of information as a result of its close ties with computers from the 1960s onward. Knowledge again seems more organizationally relevant and higher level. The knowledge economy is a term that refers either to an economy of knowledge focused on the production and management of knowledge in the frame of economic constraints, or to a knowledge-based economy. In the second meaning, more frequently used, it refers to the use

of knowledge technologies (such as knowledge engineering and knowledge management) to produce economic benefits.

Knowledge economy is also seen as a tool and asset (Drucker, 1982). Besides the term of knowledge economy, knowledge-based economy term exists. The essential difference is that in a knowledge economy, knowledge is a product; in knowledge-based economy, knowledge is a tool. This difference is not yet well distinguished in the literature. They both are strongly interdisciplinary, involving economists, computer scientists, software engineers, mathematicians, chemists, physicists, as well as cognitivists, psychologists and sociologists. Various observers describe today's global economy as one in transition to a knowledge economy, as an extension of an information society politics and programs. The transition requires that the rules and practices that determined success in the industrial economy need rewriting in an interconnected, globalized economy, where knowledge resources such as know-how and expertise are as critical as other economic resources.

According to analysts of the knowledge economy, these rules need to be rewritten at the levels of firms and industries in terms of knowledge management and at the level of public policy as knowledge policy or knowledge-related policy. In the same time, the key problem in the formalization and modeling of knowledge economy is a vague definition of knowledge, which is rather relative concept. For example, it is not proper to consider information society as interchangeable with knowledge society (Cummings, 2004). Information is usually not equivalent knowledge, as well as their use depends on individual and group preferences.

There are different kinds of knowledge that can usefully be distinguished. Know-what, or knowledge about facts, is nowadays diminishing in relevance. Know-why is knowledge about the natural world, society, and the human mind. Know-who refers to the world of social relations

and is knowledge of who knows what and who can do what. Knowing key people is sometimes more important to innovation than knowing scientific principles. Know-where and know-when are becoming increasingly important in a flexible and dynamic economy. Know-how refers to skills, the ability to do things on a practical level.

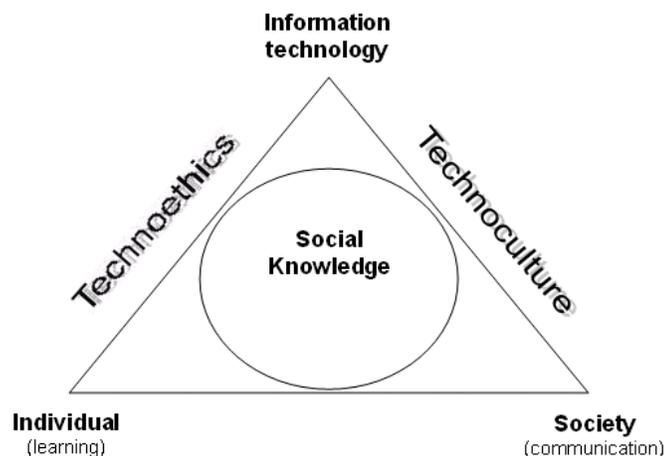
Social Networks: Overview and Brief History

A social network is basically a set of actors and relations that hold the actors together. Actors can be individuals or aggregate units such as departments, organizations, or families. Actors form social networks by exchanging one or many resources with each other. Such resources can be information, goods, services, social or financial support. These kinds of resource exchanges are considered a social network relation, where individuals who maintain the relation are said to maintain a tie (Emirbayer, 1997). The strength of a tie may range from weak to strong, depending on the number and types of resources they exchange, and frequency and intimacy of the exchange (Marsden & Campbell, 1984). Furthermore, social ties consist of multiple relations (as in the case of doctors who have a professional and

family relationship with colleagues) and are called multiplex ties (Haythornthwaite, 2002). Recently, social network studies have gained significant recognition in terms of both theory and method, and have greatly impacted research areas such as social capital, knowledge management, and organization behavior (Freeman, 2004). In fact, Borgatti and Foster (2003) note that the boom in network research is part of a general shift in, beginning in the second half of the 20th century, away from individualist, essentialist, and atomistic explanations towards more relational, contextual and systemic understandings.

Evidently, theoretical foundations of social network studies have matured to a stage where the extent of its application spans several disciplines. Furthermore, the development of computers and the Internet have provided not only tools for massive and rapid computational prowess but also a digital bridge for the creation, facilitation and sustenance of new and existing social ties. The questions that currently challenge philosophical notions of the relationship between social network, information and communications technologies and its impact on individual performance are imposed into model of social knowledge convergence presented as social knowledge convergence triangle (Figure 1).

Figure 1. Convergence model presented by social knowledge convergence triangle



The social knowledge term is connecting with the social dimensions of scientific knowledge that incorporates information and information technology. Study of the social dimensions of scientific knowledge encompasses the effects of scientific research on human life and social relations, the effects of social relations and values on scientific research, and the social aspects of inquiry itself. Several factors have combined to make these questions salient to contemporary philosophy of science. These factors include the emergence of social movements, critical of mainstream science; concerns about the social effects of technologies. Philosophers who study the social character of scientific knowledge took some type of critical interaction as central to the validation of knowledge claims. Mill (1859) argues from the fallibility of human knowers to the necessity of unobstructed opportunity for and practice of the critical discussion of ideas. Only such critical discussion can assure us of the justifiability of the (true) beliefs we do have and can help us avoid falsity or the partiality of belief or opinion framed in the context of just one point of view. The achievement of knowledge, then, is a social or collective, not an individual, matter. Peirce's contribution to the social epistemology of science is commonly taken to be his consensual theory of truth (Peirce, 1878), based on the practices by which we attain it grants a central place to dialogue and social interaction. Popper is often treated as a precursor of social epistemology because of his emphasis on the importance of criticism in the development of scientific knowledge. Two concepts of criticism are found in his works (Popper, 1972) and these can be related to logical and practical senses of falsification. The logical sense of falsification is just the structure of a modus tollens argument, in which a hypothesis is falsified by the demonstration that one of its logical consequences is false. The practical sense of falsification refers to the efforts of scientists to demonstrate the inadequacies of one another's theories by demonstrating observational shortcomings or

conceptual inconsistencies. This is a social activity.

The scientific community seeks true theories or adequate models. Credit, or recognition, accrues to individuals to the extent they are perceived as having contributed to that community goal. Without strong community policing structures, there is a strong incentive to cheat, to try to obtain credit without necessarily having done the work. Communities and individuals are then faced with the question: when is it appropriate to trust and when not? Both Goldman (1995) and Kitcher (2001) treat this as a question to be answered by means of decision theoretic models. The decision theoretic approach to problems of trust and authority treats both credit and truth as utilities. The challenge then is to devise formulas that show that actions designed to maximize credit also maximize truth. Kitcher, in particular, develops formulas intended to show that even in situations peopled by non-epistemically motivated individuals (that is, individuals motivated more by a desire for credit than by a desire for truth), the reward structure of the community can be organized in such a way as to maximize truth and foster scientific progress. Kitcher also applies this approach to problems in the division of cognitive labor, i.e. to the questions whether (and when) to pursue research that calls a community consensus into question or to pursue research that extends the models and theories upon which a community agrees.

A wide range of approaches in social and cultural studies of science has come under the umbrella label of social constructivism. Both terms in the label are understood differently in different programs of research. While constructivists agree in holding that those factors treated as evidential, or as rationally justifying acceptance, should not be privileged at the expense of other causally relevant factors, they differ in their view of which factors are causal or worth examination. Macro-analytic approaches, such as those associated with the so-called Strong Programme in the Sociology of Knowledge, treat social relations as

an external, independent variable and scientific judgment and content as a dependent variable.

Constructivism is the label given to a set of theories about learning which fall somewhere between cognitive and humanistic views. If behaviorism treats the organism as a black box, cognitive theory recognizes the importance of the mind in making sense of the material with which it is presented. It presupposes that the role of the learner is primarily to assimilate whatever the teacher presents. In its social forms, it suggests that the learner is much more actively involved in a joint enterprise with the teacher of creating (constructing) new meanings. Vygotsky laid down the most significant bases of a social constructivist theory in his theory of the Zone of Proximal Development (Vygotsky, 1978). Proximal, in this context, simply means next. He observed that when children were tested on tasks on their own, they rarely did as well as when they were working in collaboration with an adult. It was by no means always the case that the adult was teaching them how to perform the task, but that the process of engagement with the adult enabled them to refine their thinking or their performance to make it more effective. Hence, for him, the development of language and articulation of ideas was central to learning and development.

The major theme of Vygotsky's theoretical framework important in understanding social knowledge category is that social interaction plays a fundamental role in the development of cognition. He states "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals." (Vygotsky, 1978, p. 57).

A second aspect of Vygotsky's theory is the idea that the potential for cognitive development depends upon the zone of proximal development

(ZPD): a level of development attained when children engage in social behavior. Full development of the ZPD depends upon full social interaction. The range of skill that can be developed with adult guidance or peer collaboration exceeds what can be attained alone.

Information Technology and Knowledge

Information often implies a collection of facts and data, and a man's judgment cannot be better than the information on which he has based it. Thus, the new information technology potential broadens knowledge base and overall social knowledge capacities. Furthermore, the information society that is correlated with the term of knowledge society dominantly uses information and knowledge in the processes of political, working and life activities. Knowledge is key resource, and knowledge workers create new form of interactions, collaboration and communication. These processes are characterized by three main characteristics:

- Borderlessness,
- Mobility, and
- Opportunities.

Together, those three characteristics make the knowledge society a highly competitive one, for organizations and individuals alike. Information technology, although only one of many new features of the modern society, is already having one hugely important effect: it is allowing knowledge to spread near-instantly, and making it accessible to everyone. Given the ease and speed at which information travels, every individual and institution in the knowledge society has to be globally competitive, even though most organizations will continue to be local in their activities and in their markets. This is because the new information-communications systems spreading by mobile networks and Internet keep individual customers

everywhere informed on what is available anywhere in the world.

This knowledge economy relies heavily on knowledge workers that, at present, are widely used to describe people with considerable theoretical knowledge and learning. Nevertheless, the most striking growth from the wider use of information-communications systems and Internet is in knowledge technologists that, unlike prior theoretical knowledge workers with their individual capabilities, work and prosper on the realm of social knowledge. In coming years, just as unskilled manual workers in manufacturing were the dominant social and political force in the 20th century, knowledge technologists become the dominant social and political force in information society.

Social Media

The possibilities of Social Media proliferated by information technology and Internet, are based behind the idea of understanding the emotional relevance of the communication tool called the Internet. The social media is not new phenomenon that is changing the world and there is no new position of the media. All media is social in the sense that it is created and delivered in a society for the purpose of communicating, which is a social activity. However, when the information technology is embedded in media activities and collaborations, the new information-communications systems open the way people could share the space, time, content, and communication channels. They share, they play, they collaborate, and there is a myriad of every type of conversation.

Social Media is the democratization of content and the understanding of the role people play in the process of not only reading and disseminating information, but also how they share and create content for others to participate. It is the shift from a broadcast mechanism to a many-to-many model, rooted in a conversational format between authors and people.

Thus, the social media is, in its basic, elemental form: conversation. All members of society, entire community, small group or so, participates in some form of conversation - all together, in groups or in pairs. Information technology is here to make only the platform for conversation. Each has a different way of going about it, and each one attracts different sorts of people, but they all accomplish the same thing: bringing people together in conversations about the subject sharing knowledge, emotion and cultural values and norms.

Social media are distinct from traditional media industry (newspapers, television, and film). Social media is content created by people using highly accessible and scalable publishing technologies over the Internet. At its most basic sense, social media is a shift in how people discover, read and share news, information and content. It is a set of technologies, tools and platforms facilitating the discovery, participation and sharing of content. It is transforming process in which monologues (one to many) are changing into dialogues (many to many). It is also one sort of democratization of information, transforming people from content readers into publishers. Social media has become extremely popular because it allows people to connect in the online world to form relationships for personal and business. Besides ordinary social media in the context of Internet use, community media is an interesting hybrid of new and traditional media. They use both social and traditional media industry frameworks.

Primarily, social media depend on interactions between people as the discussion and integration of words to build shared-meaning, using information technology as a medium. While social hypermedia is relatively inexpensive and accessible tool that enables anyone to publish or access information, traditional media industry generally requires significant resources to publish information. On the positive side it enables new search strategies based on our social knowledge, it lowers the social cost of accessing and sharing information, and it makes the Web a more interesting and engaging

place. On the negative side, it creates a host of new opportunities for social gaffes, and defines a new realm in which tensions between organizations and individuals may be manifested. It will be interesting to see how this plays out, and whether the tensions can be resolved without losing the provocative blend of personal and professional that can engender social activity. Although the Web may be just the latest fashion to sweep the Internet, if it turns out to be a medium that allows the construction, negotiation, and propagation of the styles of appearance that we refer to as fashion, then its impact may be profound indeed.

MODELING SOCIAL KNOWLEDGE CONVERGENCE

Many studies tacitly view social knowledge use as a transaction between knowledge producers and knowledge users thus framing analysis within an implicit bipolar model of use. Although rarely explicit, such models do entail choices at different levels; they entail (1) methodological choices, (2) conceptual choices regarding how one will view social science's role in public decision making, and (3) choices among broader social philosophies. The choices at each level involve scientific as well as ethical judgments.

Bringing information into the Web and social media is in fact a social act, and the relationship between informational artifacts on the Web is communicative. This can produce intentional and unavoidable inconsistencies of ontological concepts (various conceptualizations due to differences in culture). If these are ignored, or filtered out, or homogenized too early (e.g. by applying trust relationships or recommendations), important information about the social landscape of knowledge might be lost. Thus, Web knowledge can be considered as communicative among autonomous entities (individuals), because it is generated in order to influence its recipients with often unknown intentionality, reliability, and user reception. This

is even true if knowledge is communicated indirectly and asynchronously using e.g. Web pages or databases instead of information agents. Web knowledge is also contextualized with other Web knowledge, and it can be agreed and denied by other knowledge on the Web.

Since the dawn of the information age, the term technology has only been defined as an application and innovation of techniques in the art of sciences. Following the definitions from the dictionaries of the English language, the term technology generally refers to two discourses; one of which is the application of knowledge for both practical and mechanical science; and the other is the connection it has to the change and manipulation of the human environment. In the same time, when information technology is in the context of definition, technology is defined as applying a systematic technique, method or approach to solve a problem. In the same time, much of today's technology implies the use of computers. However, technology is more than just operative machines and elaborated techniques of tools for human use. Technology is also cultural embodied. Besides that, technology is gendered. Since the technology embodies social and cultural relations, the implications that technology is gender neutral are impossible. What can be said about this notion is that men and women's experiences differ with technology.

Further, the technology is not only a set of praxes that applies to the practical or mechanical art of sciences that requires certain amount of human skills, but it also embodies a cultural structure which reshapes information society. It must be known that high and low technologies both play a significant role in a culture. Technology is not just limited to computers and other information appliances. Technology is so deeply rooted in society that the blurring between the lines of techno (technoethics) and cultural (technoculture) determinism has become more apparent. However, what is clear is that technology does not stand on its own, and neither does society. In this contextual

approach, Technoethics is about processes of information technology use, while Technoculture is about the knowledge acquisition, communication and retention by information technology.

These arguments was the base for introducing in this research, the model of convergence (Convergence Model) which is assumed to be a relevant tool for understanding complexity of social knowledge environment. The proposed model starts from defining the systems of interaction; furthermore, it accomplishes relationships that inevitably involve information technology. These relationships are separately denoted through the three axes of the Social Knowledge Convergence Triangle.

In the context of information society where social knowledge is empowering by information-communications systems, the social knowledge is mostly dealing with the two core interaction systems. The one is about interaction between individual and technology and the other one is about interaction between society and technology. The first interaction system is defining technoethics component while the second interaction system is defining technoculture component of social knowledge corps in an information society. In the process of system analysis, the Technology and Society convergence - convergence model is build and presented by Social Knowledge Convergence Triangle. Each node of the triangle presents modular integrity depending on current technology development, technology awareness and particular modes of sharing and envisaging knowledge corps within entire culture environment.

The principal idea on social knowledge convergence is the notion of a shared cognitive and social context that has to be established in order for the members of the Internet and new media community to negotiate shared meanings, and hence construct collective knowledge. Since the major elements of this shared context include implicit technology and knowledge that resides only in community members, the critical question

becomes how to create possibilities for externalizing and sharing this implicit knowledge? The exchange of knowledge in such social networks is commonly reflected in a collaboratively constructed information pool that contains heterogeneous domains of knowledge expressed in different terminologies and by different digital artifacts. The heterogeneous domain of knowledge and the decentralized and loosely structured mode of community interaction make it difficult to express the knowledge contained in the community information pool by means of a predefined taxonomy or ontology. Furthermore, as knowledge is strongly tied to individual experts, the contents of the information pool that archive the exchange of the community members will merely reflect some externalized part of this knowledge. Hence, as a central issue for supporting the exchange of knowledge in social networks communities is about issuing solutions for collaborative discovery of knowledge in heterogeneous information pools.

Social knowledge convergence model exposes two mediated axis each consisting information technology but in different level. Since the technoethics is merely considered as interactions between individual member of social network or group/society with information technology, technoculture comprises the knowledge, artifacts and invisible culture deployed by information technology. Each axis bears its own structural components and issues that have impact on social knowledge corps of entire information society. Shaping its activities, each component converges to the use of information technology in order to create social knowledge available, accessible, understandable, and sharable.

The presented model is further discussed in following sections dealing with the technoethics and technoculture issues. These issues make the understanding social knowledge paradigm clearer, and this is the basis of evaluating social knowledge deployment and its effects in information society.

The Model of Convergence

Axis 1: Individual-Technology Providing Technoethics

In the process of determining the processes and the context of Axis Individual - Technology helping to frame Social Knowledge, there is a tool Social construction of technology. Social construction of technology or SCOT is a theory within the field of Science and Technology Studies that argues that human action shapes technology rather than technology determining human action. The term “social construction of technology” can be used to denote two different things. First, it is a research approach to study technical change in society, both in historical and in contemporaneous studies. Second, it is a theory about the development of technology and its relation to society. The phrase “social construction” was first used by Berger and Luckmann (1966). Building on the phenomenological tradition, they argue that reality is socially constructed and that these processes of social construction should be the object of the sociology of knowledge.

The SCOT approach also proposes that for any given situation a number of technological artifacts arise. Initially there is great flexibility of design with many alternative technologies being available for adoption (Bijker, 2010). As a direct response to technology determinism, social construction of technology also argues that to understand a piece of technology, you have to understand it in its context of use. However, we have human action not just shaping the technology but also shaping how the technology needs to guide humans towards specific human action in the future. It is obvious that technology cannot be understood devoid of context and the level of individual knowledge. Advocates of SCOT acting as social constructivists, argue that technology does not determine human action, but that rather, human action shapes technology. They also argue that the ways in which a technology is used can-

not be understood without understanding how that technology is embedded in its social context. SCOT is a response to technological determinism and is sometimes known as technological constructivism. SCOT holds that those who seek to understand the reasons for acceptance or rejection of a technology should look to the social world.

On the individual level of information technology use, it can be postulated that those who are in an advantageous network position, and who use information technology for both task-level and non-relational and relational forms of obtaining information, are those who perform better. The argument is based on three reasons:

1. Those who are using information technology for communication purposes are those who have accepted use of the technology and are using it for both relational and non-relational information acquisition and knowledge,
2. Such individuals are more information technology literate, and are continuously influenced by non-redundant social peers about novel information and new developments in technology and professional know-how work through explicit learning, and
3. Their literacy and knowledge about new task and technology know-how continuously feeds and assimilates into the individual’s professional state of mind and attitude towards work allowing them to capitalize on information and control benefits to perform better.

Axis 2. Society: Technology Providing Technoculture

In reshaping society interaction with technology, Williams and Edge (1996) advocate Central to Social Shaping of Technology (SST) concept. The concept is based on the notion that there are choices inherent in both the design of individual artifacts and systems, and in the direction or trajectory of innovation programs. If technology does

not emerge from the unfolding of a predetermined logic or a single determinant, then innovation is a disoriented. Different routes are available, potentially leading to different technological outcomes. Significantly, these choices could have differing implications for society and for particular social groups. In the same time, Social Shaping of Technology is one of the models of the technology - society relationship. It is concerned to explore the material consequences of different technical choices, but criticizes Technological determinism, which argues that technology follows its own developmental path, outside of human influences, and in turn, influences society. In this way, social shaping theorists conceive the relationship between technology and society as one of mutual shaping. It defines the technoculture of entire information society - Technoculture Axis of Social Knowledge Convergence model.

Axis 3. Individual: Information Society Providing Converged Social Knowledge

The process of information transformation into knowledge may be structured through three separate levels of transformation activities:

- Formalization of information, visualization by means of symbols and graphs, the use of analogies and metaphors, which offer alternative, probably better known schemes of comprehension, and thorough explanation or reformulation of information in the case of several individuals failing to pass this lowest level of the model. On the side of the information recipient, additional training and education can be used to help establish a common syntactic space.
- Contextualization of information in order to establish a common interpretative space - where past experiences are constantly re-interpreted and modified in order to fit into the currently valid system of relevancies. It

is important, however, to notice that an internalization of objectivations is generally more successful if communication takes place in vis-à-vis situations. Any form of mediated communication is thus inferior to face-to-face communication and in an attempt to synchronize associations and establish a common interpretative space we can make use of these specific dynamics of social interaction.

- Valuation of information through the processes of reciprocal learning, prioritization of relevancies, and social objectivations.

In the case of knowledge networks, we have large amounts of socially distributed knowledge and high degrees of specialization of the knowledge workers. Thus, assessment of social knowledge in this context is highly dependent on individual knowledge of experts, who can add importance and truthfulness to given knowledge part or information.

Performance of individuals in knowledge-intensive work through network effect synergy has been documented in studies on communication, sociology and social psychology (Leavitt, 1951; Guetzkow & Simon, 1955). With the advent of the Internet in the early 1990s, the importance of contemporary information and communications technologies have become instrumental for the formation and sustenance of ties especially for individuals and groups across different geographical locations. With the availability of Web 2.x and Web 3.x technologies today, the arena for social networking has changed dramatically with a great deal of social relations being conducted online.

The effect of information technology use on individual work performance has also been sufficiently well documented in Information Systems research (Kraemer & King, 1988; Malone & Rockhart, 1991; Goodhue & Thompson, 1995). Shifting the emphasis from productivity gains through information technology use, recent stud-

ies now focus on the communication structure effects in organizations and communities as a result of information technology use (Pickering & King, 1995; Nardi, Whittaker, & Schwarz, 2000; Katz, 2008). This is because information technology is replacing traditional resources for developing an actor's social network (Nardi et al., 2000). While most social network studies have assumed ties being conducted face-to-face, such studies formally emphasize on one strand of tie - often work relations, therefore neglecting the multiplex character of personal networks, which tend precisely to intersect several social relations (Licoppe & Smoreda, 2005). Furthermore, although the general argument from these studies remains that an individual's social ties are developed, facilitated and maintained through information technology, very few actually report on the interactions between information technology use and individual performance. Individuals often work within a network of informal links that fits into a larger social structure. Such ties are generally geographically dispersed, specialized, and connected by information technology that facilitates communication and information/knowledge transfer.

These issues are incorporated into Convergence Model to sharply distinguish the roles of the each category and, in the same time, to clarify their interdependency.

INFORMATION TECHNOLOGY EVOLUTION AND ETHICS: TECHNOETHICS AXIS

The explosive developments that currently transform computer-mediated electronic communications most certainly will impinge in various ways upon the organization and conduct of scientific and engineering research. The emergence of new communications facilities affects everything from new, electronic working paper and journal publications, and specialized dynamic database services,

to the prospective growth of an upgraded Internet that will support enhanced information search, filtering and retrieval services, virtual laboratory environments, and remote shared access to large information technology based facilities. These tools are almost certain to alter profoundly the way that normal knowledge bases are organized during the 21 century. But, if the opportunities of collaboration and sharing of both physical and data resources on a global scale are in the process of being greatly expanded, there also are counter-tendencies that may undermine long-established traditions of co-operation and lessen the domain of open knowledge endeavor.

We need not assume that technological thought is a single monolithic whole or that it can be uniquely characterized in any single formula. Yet it does have characteristics that differentiate it from science. In this regard, it is interesting to note that in the last century, technology was correlated to the common denominator. It was identified as design or the ability to design. The ability to design has been almost universally acknowledged as the crucial test, though in practice only the most professionally oriented societies have actually adopted it. Design is by its nature, clearly distinct from philosophy, including natural philosophy. It is an attribute of a human being, which could be expressed in an object. However, it is not identical with the object itself. At the outset, design is an adaptation of means to some preconceived end and it is in many cases the central purpose of technology. Thus, we may view technology as a spectrum, with ideas at one end and techniques and things at the other, with design as a middle term. Technological ideas must be translated into designs. These in turn must be implemented by techniques and tools to produce things. The current model of science-technology relations looks at only one end of the spectrum. It would be an equal distortion to see technology solely as thought. Both aspects dealing with the information society agenda are needed for a balanced view incorporating shared meaning.

Shared meaning is the difference between personal knowing and acquired understanding or social knowledge. It is often the product of dialogue, which helps to create a collective meaning. This is the power behind language and communication. Points to the essential role of sharing critique, alignment and reflection in learning. Meaning is established through patterning, and emotions play a key role. To make meaning explicit and ensure alignment, it is essential to question and test assumptions. Thus, knowledge is more a living process than acquisition of an object; it is closely tied to person, and it emerges in dialog or through copy and practice. Lasting knowledge is knowing more than definitions, concepts and relationships, it is feeling what is right in a particular situation, requires personal engagement, passion and a community to emerge. Learning and knowledge require an ecology to thrive and evolve. With the information technology in use, this is about technoethics exposition of technological issues.

Argyris and Schon (1996) argued that people are selective in data acquisition from their environment. They may quickly use a hierarchy of inference in their mind and create relationships among these new data with their assumptions and beliefs, and finally exhibit behaviors based on their inferences. Unfortunately, such inferences are usually untested and sometimes incorrect (Senge et al., 1994; Argyris & Schon, 1996). Implicit inferences are rapid, effortless, and outside conscious awareness. On the other hand, explicit inferences require awareness and effort (Johnson-Laird, 1983). These notions play crucial role in forming technoethics portfolio of entire community and society.

The rate of technological change has greatly increased over the past thirty years. With today's information technology development and global telecommunications infrastructure, more information can be sent over a single cable in one second than a month's worth of information sent over the entire Internet in 1997. Analysts look to this when

anticipating the successful convergence of broadband and digital entertainment (Gilder, 1994).

This notion could be connected with the issues of the three laws covering the information technology issues.

Gilder's Law (Gilder, 2000) holds that bandwidth grows at least three times faster than computer power. This means that if computer power doubles every eighteen months (per Moore's Law), then communications power doubles every six months.

Moore's Law (Moore, 1965) holds that the maximum processing power of a microchip at a given price doubles roughly every 18 months. In other words, computers become faster, but the price of a given level of computing power halves. Gilder's Law - the total bandwidth of communications systems will triple every 12 months - describes a similar decline in the unit cost of the net.

Metcalf's Law (Metcalf, 1995) holds that the value of a network is proportional to the square of the number of nodes. It states that the usefulness, or utility, of a network equals the square of the number of users. Thus, as a network grows, the value of being connected to it grows exponentially, while the cost per user remains the same or even reduces. While Metcalf's Law has been applied to the Internet, it is also true of telephone and digital television systems.

New scientific and technological developments are transforming society into a knowledge society as they become deeply embedded in popular culture, private and public affairs, work and educational settings, social practices, and public institutions. Knowledge derived from information technology developments is redefining key aspects of social life and individual behavior. One ongoing struggle within evolving knowledge society is that increasingly potent technological growth is forcing individuals to cope with information technology in new ways according to their prepositions, knowledge and understanding.

The concept of knowledge society is the most suitable term available for describing technoethical inquiry in society. First, although the terms are often used interchangeably, knowledge is more closely aligned with organized aspects of human life and society where information and technology are influential, such as knowledge management and knowledge economy. It more closely links to core human activities within organizations and society (knowledge management, knowledge organization, knowledge creation, knowledge economy) whereas information society are more focused on information technology, which is one aspect of technology and technique which does not address environmental or economic considerations as closely as knowledge does.

Technology becomes occasion of interwoven relations: the aesthetic vision redeems it from the danger, at times unduly exasperated, of substituting man, and assumes it in a fully humane condition. The technology itself, the more it improves and the more it disappears behind its function, the more its true finality is made transparent: man. Thus, it opens the questions of the culture and ethics role in technology design, implementation and use.

The concept of ethics is not a consensual one among the different investigators: for some it means a set of rules, principles and values that may be mistaken for morality from a broader point of view. Concerning the cognitive dimension of attitude towards ethics, the subject of ethics and professional deontology strengthened the answers to the questions with lower scores. Concerning the affective/assessing attitude of ethics, the subject of ethics and professional deontology strengthened the professionals' convictions about the importance of the existence of a deontological code, of ethical principles and of accounting information, as well as the question with the lowest score. It is a paradoxical question: on the one hand, the modern man depends heavily on technology; on the other, he tends to believe that technology is anti-human, a reality against which he ought to defend himself. The proposal of technoethics

is aimed at overcoming this paradox and these issues must be covered deeper and with relevant literature background.

Technoethics

Technoethics has been defined in a variety of ways over the last decade that highlights different aspects of this emerging field. It has roots in Science and Technology Studies, philosophy of technology, and various sub-areas of Applied Ethics that focus on technology. The term Technoethics was coined in by the philosopher Bunge to describe the responsibilities of technologists and scientists to develop ethics as a branch of technology (Bunge, 1977). Additionally, Galván (2003) defined Technoethics as the sum total of ideas that bring into evidence a system of ethical reference that justifies that profound dimension of technology as a central element in the attainment of a 'finalized' perfection of man. Bao and Xiang (2006) described Technoethics as the behavioral norm and ethical basis for the global community. The Handbook of Research on Technoethics defined Technoethics as an interdisciplinary field concerned with all ethical aspects of technology within a society shaped by technology. It deals with human processes and practices connected to technology that are embedded within social, political, and moral spheres of life (Luppincini, 2008).

Regarding the contextual relation to the information technology, technoethics denotes a broad range of ethical issues revolving around the use of information appliances, software and computerized and networked digital content. Thus, technoethics is seen as an interdisciplinary research area concerned with all moral and ethical aspects of technology impact on individual in society. It draws on theories and methods from multiple knowledge domains to provide insights on ethical dimensions of technological systems and practices for advancing a technological society. Technoethics views technology and ethics as socially embedded enterprises and focuses on discovering

the ethical use of technology, protecting against the misuse of technology, and devising common principles to guide new advances in technological development and application to benefit society.

In the information age, where knowledge society acts as the point of integration, little by little, the motor, electricity, telephone, and Internet have introduced themselves into the everyday life of man to the extent that no notice is taken anymore of them excepting when they are lacking. One can add that in the last years, the process has only accelerated and everything has been invaded by technology: even the most fundamental mechanisms of the production of life have fallen under its dominion. That is why a deontological code exposes its significance in every profession especially when we speak about technology.

With the information technology impact on new social knowledge technosphere, we also must address consequences of collective action. Technological risks are of special concern. The nature of many technological risks is far beyond the framework of individual responsibility. Such risks arise as a consequence of an interaction of semi-independent systems, many of which may themselves be in part so complex as to be outside direct control (Asveld & Roeser, 2009). Many of the technological risks in information society have the same status as natural catastrophes. In response to this problem, we would need an ethics of collective co-responsibility. Such a collective ethics of co-responsibility arises from reflection on the social processes in which technological decision-making is embedded. This notion is transposed into the technology assessment portfolio.

Technology assessment (TA, German *Technikfolgenabschätzung*) as the study and evaluation of new technologies is based on the conviction that new developments within, and discoveries by, the scientific community are relevant for the world at large rather than just for the scientific experts themselves, and that technological progress can never be free of ethical implications. Also, technol-

ogy assessment recognizes the fact that scientists normally are not trained ethicists themselves and accordingly ought to be very careful when passing ethical judgment on their own, or their colleagues' new findings, projects, or work in progress. This notion is crucial to connecting technology and ethics into one category, which is about technoethics on global scene. It is obvious that technology assessment assumes a global perspective and is future-oriented rather than backward-looking or anti-technological.

Technology assessment considers its task as interdisciplinary approach to solving already existing problems and preventing potential damage caused by the uncritical application and the commercialization of new technologies. Therefore, any results of technology assessment studies must be published, and particular consideration must be given to communication with political decision-makers. Further, the main role in the field of technoethics in the context of knowledge society is under the term of information ethics.

Information ethics is on the way as applied ethics of knowledge society and it asks for insight into principal areas of Ethical Implications. Discussion on ethical implications should include twofold approach. On the one hand, discussion on pure information ethics, which concerns itself with the use and misuse of information (intellectual property, open or restricted access to information, censorship, use of government data, privacy and confidentiality, data integrity, international information flow). On the other hand, discussion on what relates specifically to professional conduct, namely, professional ethics or how ethical principles are applied to the actions and decisions taken by information professionals. Since the information and communications technology is a transformative technology having the power to change social relationships, it deserves more words on normative recommendations to practitioners and useful insights to scholars for further research in the field.

The special scope of the information ethics as applied ethics is connected with the term of casuistry. Casuistry is an applied ethics term referring to case-based reasoning, law and ethics, and often is a critique of principle-based reasoning. Critics use the term pejoratively for the use of clever but unsound reasoning, especially in relation to moral questions. Casuistry is reasoning used to resolve moral problems by applying theoretical rules to particular instances. Casuistry attempts to establish a plan of action to respond to particular facts - a form of case-based reasoning. By doing so in advance of actual investigation of the facts, it can reduce influence of interest groups.

However, there is the serious need for society to exploit technology to improve communication and public interest in democratic decision making on important issues that influence society and the modern world. Dewey (1927) portrays technology as a distracting force contributing to the lack of public participation in political decision making. He describes how modern technology, in combination with corporate interests and the ambiguous nature of public communication, can distract individuals from participation in public decision making on important matters of societal concern. Dewey viewed the advent of new technologies in modern society (movies, motor cars, etc.) as a powerful diverting force fragmenting the public into many public spheres with special interests.

Marshall McLuhan was responsible for popularizing the study of technology in Communication by drawing attention to the influence of modern communications technology on the human senses and understanding. McLuhan (1962) attempts to show how communications technology influences the cognitive organization of sensory experiences, which in turn, alters the social world. He argued that the media, rather than the content, should be the main focus of study (the medium is the message). By drawing attention to the importance of studying the relation between media technology, the senses, and society, McLuhan raised the awareness of the close connection and dependency humans have

with the technology they create and use. This notion is of crucial importance in the context of information and knowledge society paradigm.

Beginning in the 1970s under the umbrella of Computer Ethics, a surge of new academic research focused on human aspects of computer use and ethical guidelines. Work in Computer Ethics continued to expand throughout the 1980s and 1990s as the rapid advancement of computer technology significantly influenced many aspects of life and society. In the mid-1990s, work in computer ethics expanded in scope, partly due to the widespread view of the 'information society' and new work in computer ethics under the heading of information ethics (and other areas). Information Ethics extended computer ethics in addressing ethical issues arising from the development and application of information technologies used in computing. This work was based on notion of infosphere (Floridi & Sanders, 2003), which described the informational environment constituted by informational entities, including processes and interactions. Under this broadened framework, the range of computer ethics also included the social and ethical study of information technology.

Rooted in Media Studies, Discourse Ethics, Organizational Communications, and Communication Theory, Media and Communication Technoethics arose as an area of Technoethics concerned with ethical issues and responsibilities when using new media, information and communications technology (Mitcham, 2005). Technoethics is a rapidly expanding research area that evolved during the 1970s and 1980s from the confluence of a variety of disciplines and disciplinary subfields that viewed science and technology as socially embedded enterprises. Bunge (1977) argued that the current state of technological progress was guided by ungrounded practices based on limited empirical evidence and trial-and-error learning. He recognized that the technologist must be held not only technically but also morally responsible for whatever he designs or executes: not only should his artifacts be optimally efficient but, far from

being harmful, they should be beneficial, and not only in the short run but also in the long term. The early development of Technoethics is rooted in the cross-fertilization of sub-areas of Philosophy of Technology, Applied Ethics, and Science and Technology Studies, which focus on the inter-connection of technology and ethics embedded in society. Key scholarly contributions linking ethics, technology, and society can be found in a number of seminal works (Jonas, 1979; Jonas, 1985; Mitcham, 1997; Galván, 2003; Tavani, 2004). This resulting scholarly attention to ethical issues arising from technological transformations of work and life has helped given rise to a number of key areas (or branches) of technoethical inquiry under various research programs (i.e., computer ethics, engineering ethics, environmental Technoethics, biotech ethics, nanoethics, educational Technoethics, information and communication ethics, media ethics, and Internet ethics).

CULTURE AND TECHNOLOGY ISSUES REGARDING SOCIAL KNOWLEDGE: TECHNOCULTURE AXIS

Individual cognition, including the development of knowledge that is new to that individual, is governed, though not determined, by a dense network of rules and familiar relationships, many of them partly or wholly tacit. When these rules and relationships are shared within a community, we call them institutions. Many of the rules and relationships on which each of us relies are indeed institutions in this sense; but it is important to recognize that their origin, as a class of phenomena, lies not in the management of interactions but in the requirements of effective individual cognition. Indeed, it is in this fundamental cognitive requirement that we can discover the possibility, as well as the incentive, for developing the institutions that guide interactions.

It is important for individual values to match organizational culture because a culture of shared meaning or purpose results in actions that help the organization achieve a common or collective goal. An organization will operate more productively as a whole when key values are shared among the majority of its members. To that end, employees need to be comfortable with the behaviors encouraged by the organization so that individual motivation and group productivity remain high. High functioning organizations are comprised of individuals whose overt behaviors are consistent with their covert values.

On the most basic level, culture is observable as a set of behaviors of individuals making groups and entire society. Examples of culture at this level include the degree of formality with which employees conduct themselves, the organization's dress code, and the type of technology used. Beneath the level of observable behaviors are the values that underlie behavior. Though these values determine behavior, they cannot be directly observed. At an even deeper level are the assumptions and beliefs that determine values. While an organization's or individual's values may remain within awareness and can be stated, assumptions and beliefs often exist beneath the surface and out of conscious awareness. There is known notions that values exist in every workplace. The specific collection of values and norms that are shared by people and groups in an organization and that control the way they interact with each other and with stakeholders outside the organization, makes the forefront of entire culture - organization culture. Organization's culture is partially the outward demonstration of the values currently existing in workplace and an organization. Besides the individual values, shared values exist, too. Shared values are what engender trust and link an organization together. Shared values are also the identity by which an organization is known throughout its business areas. These values must be stated as both corporate objectives and individual values.

Organization culture is dominant category in expanding social knowledge paradigm. One tool used to diagnose organizations and help executives change their culture is called the Competing Values Framework (CVF). The CVF consists of a framework, a sense-making tool, and a set of steps to analyze and change organizational culture. CVF is best explained with Figure 2 just as below.

In Figure 2, four type of culture schematic is shown regarding the definitions stated in the context of learning organization (Roman-Velazquez, 2005). There are two dimensions used in this chart. From left to right, we are looking at “internal versus external” factors such as employee satisfaction, customer service, market share and profitability. From bottom to top, we are looking at the “control versus flexibility” factors such as the internal processes, policies and systems that maintain stability and consistency at one end, and adaptability at the other. These two dimensions of the CVF produce four quadrants: Clan, Adhocracy, Hierarchy, and Market culture.

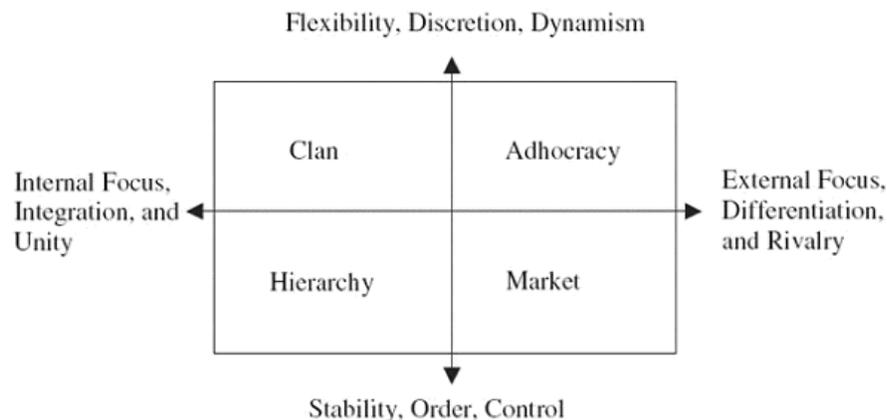
- **The Clan Culture:** Dominant in flexibility, discretion, dynamism, internal focus, integration and unity.
- **The Adhocracy Culture:** Dominant in flexibility, discretion, dynamism, external focus, differentiation and rivalry.

- **The Market Culture:** Dominant in stability, order, control, external focus, differentiation and rivalry.
- **The Hierarchy Culture:** Dominant in stability, order, control, internal focus, integration and unity.

It has been well established that countries differ in some cultural dimensions, which include sets of values, norms, and beliefs (Hofstede, 2001; Richardson, 1991). Although many cultural dimensions have been proposed and used in past cross-cultural studies (Hofstede, 2001; Triandis, 1995; House, Javidan, Hanges, & Dorfman, 2002), individualism, collectivism, and power distance have arguably been the most influential dimensions in many cross-cultural studies. According to Hofstede (2001), individualism refers to the degree to which people are supposed to look after their personal interests rather than those of groups to which they may belong. On the other hand, collectivism refers to the extent to which individuals are integrated into their groups. Triandis (1995) defined collectivism as a social pattern in which people perceive themselves as a part of one or more collectives.

While our culture generally trusts experts and distrusts the wisdom of the masses, under the right circumstances, groups are remarkably intelligent,

Figure 2. The competing values framework presenting cultural issues in social knowledge



and are often smarter than the smartest people in them (Surowiecki, 2004). To support this almost counterintuitive proposition, Surowiecki explores problems involving cognition, coordination, and cooperation. Furthermore, many researchers have tried to explain how culture affects individuals' attitudes and beliefs, and in turn how they may affect individual and group behaviors (Markus & Kitayama, 1991; Triandis & Gelfand, 1998). Markus and Kitayama (1991) suggested that people in collectivistic societies are more likely to take their relatedness with others into account when describing themselves; they have an interdependent construal of self. On the other hand, people in individualistic cultures are more likely to emphasize their uniqueness, rather than their connectedness with others (Markus & Kitayama, 1991; Triandis, 1995). Individualism and collectivism as cultural dimensions have been shown to be related to communication styles through the mediating effect of self-construal making culture more important factor in communicating information and knowledge.

Individualism and collectivism are important cultural factors, which may affect the effectiveness of applying knowledge. It has been argued that a fundamental issue for understanding collectivism and individualism is to distinguish in-groups and out-groups (Triandis, 1995). In-group refers to a collective in which members are interdependent and have a sense of common fate. In contrast, groups to which they do not belong are out-groups. People in collectivistic societies tend to belong to a few in-groups with great commitment and loyalty (Triandis, 1995). People in individualistic societies may belong to more in-groups, but their relationships with other group members tend to be looser than for collectivists. Therefore, individualists are arguably able to leave their groups more easily than collectivists do. There is evidence that collectivists are more likely to distinguish out-groups from in-groups than individualists. (Triandis, 1995). Thus, societal collectivism referred to "the degree to which organizational

and societal institutional practices encourage and reward collective distribution of resources and collective action" (House et al., 2002, p. 5).

These notions strongly influence social knowledge volume and effectiveness in collective functioning. Social knowledge is created by working with knowledge through people, building relationships and trust, deep dialog and creative abrasion. There needs to be diversity of ideas and an environment where failures and reflection are valued as learning and knowledge enablers.

Learning as prerequisite for a collective knowledge composition, becomes the new scope of research dealing with constructivistic learning. Constructivism is a theory of learning in which the learner uses prior understandings in concert with current experiences to construct, elaborate or restructure their knowledge. The teacher's role is to support that active process through exploration and dialogue (Windschitl, 2002). In the same time, Windschitl argues that constructivism is a cultural system and not just a set of strategies, which has the potential to create learners who are able to make sense of the world.

Constructivism as a philosophical and theoretical foundation represents a break from the traditional assumptions within social studies of passive, teacher-dominated approaches emphasizing recall and regurgitation (Crocco, 2001). Constructivism employs a more flexible, culturally relativistic, and contemplative perspective in which knowledge is a personal construction based on social experience of individuals through learning activities. The active versus passive perspective leads to an emphasis on activity. This activity requires both social activity, as the source of knowledge and meaning construction, and individual mental activity, as the mechanism of remembrance. While knowledge construction involves both social and individual processes, "the process of personal meaning-making takes a backseat to socially agreed upon ways of carving up reality, however. The community is the prime

source of meaning for objects and events in the world” (Prawat, 1996, p. 220).

According to Fosnot (1996), the instructivist, or behaviorist, approach is laid down as the techniques of partitioning knowledge consisting individual thoughts through the process of sequencing these parts into a hierarchy ranging from simple to more complex. Thus, constructivism emphasizes the active role played by the individual learner in the construction of knowledge (Fleury, 1998), the primacy of social and individual experience in the process of learning, and the realization that the knowledge attained by the learner may vary in its accuracy as a representation of an objective reality. The adoption of this theoretical foundation changes the nature of the social studies from one of a search for objective truth to one of a search for valid perspectives.

However, constructivism is not a unitary theoretical concept, resulting in several different types of constructivism (Phillips, 1995). Generally, these different types of constructivism are categorized into three main genres: cognitive constructivism, social constructivism, and radical constructivism. In the context of social knowledge corps, the social constructivism is considered since it emphasizes the social nature of knowledge and the belief that knowledge is constructed through social interaction and is a shared rather than an individual experience. The main principle of social constructivism is regarding knowledge construction that is being an active process of social interaction and personal reflection and not a passive process of knowledge absorption. Knowledge cannot simply be transmitted from individual to individual. It is built up through the synthesis of social experiences and communication shaped by pure culture and social values. That is, knowledge is constructed in response to social interactions through social negotiation, discourse, reflection, and explanation that make the entire culture of society.

More recently an idea of cultural constructivism is being discussed, educators are recognizing that both teachers and learners are more mobile

and that increasingly both are asked to teach and learn in situations that are very different culturally than those in which they are most familiar (Richardson, 2003). This cross-cultural teaching creates problems when choosing content, school systems, assessment, classroom communication, and teaching methods. Using constructivist theory as the basis for classroom instruction in these multi-cultural settings allows teachers to teach with both the individual and their values and past experiences in mind (Hutchison, 2006).

Critical constructivists add another layer to the belief that knowledge is socially constructed. Most closely connected with the social studies content area, it is based on the comparison between logical positivism and traditional social studies. When content knowledge is defined as a series of objective facts, knowledge is static and because competing explanations are not acceptable, history is presented from a single perspective meant to explain all individual experiences. Critical constructivists call on learners to understand the power structures and interests, which shape the knowledge that is presented as facts. Content knowledge is then understood to have multiple perspectives and is constructed by humans (Fleury, 2001).

Another significant problem is ability of individuals to assess knowledge of another individuals as well as collective knowledge. Teachers in such processes need an in depth understanding of the content area along with a large vocabulary so that they can communicate with students about their knowledge constructs (Richardson, 2003; Windschitl, 2002). In the context of information technology use, teachers are overly concerned with a learners “knowledge of”, or gaps in factual content, at the expense of “knowledge that”, or the complexity of ideas. The later is certainly more difficult to assess given the frequent lack of descriptive language on the part of both the teacher and the learner. This type of monitoring, which checks for a good level of reasoning, requires that the teacher and learner have close ties in order to

build sufficient language skills to communicate their knowledge constructs (Windschitl, 2002). These skills are mostly the product of entire technoculture milieu (or social environment).

Technoculture

Culture in modern society is becoming saturated with new media, in which many aspects of myriad people's lives are mediated by technology. Technologized media themselves now constitute modern culture, and they have become the primary vehicles for the distribution and dissemination of e-culture. Changes in global society and technoculture are combining to mobilize transformative alternatives to mainstream media, politics, economics and formal education itself encompassing the Internet, computers, cell phones, digital cameras and recorders, and global positioning system devices. They do it to orchestrate the anti-globalization and anti-war movements, new political organizations and protests, along with novel forms of technoculture. Emergent forms of technoculture in information society utilizing social media are potentially involved in a radically democratic social and educational project that amounts to the mass circulation and politicization of information and culture. In a dynamically evolving and turbulent global technoculture, multiple literacies will require multicultural literacies. Communicating and interacting with different groups and individuals demands being able to understand and work with heterogeneity of people and spaces, as well as the acquisition of social knowledge. The new reorganization of the workplace occurs in many business and industries, resulting in the need for knowledge workers to accomplish tasks involving the use of information, systems technologies, and personal and interpersonal (shared) resources. Hence, information technology becomes the tool that affords workers immediate access to all kind of information. Such accessibility asks for techno-

culture instrumentation coping with the ecosystem of the new information technology based society.

The decisive shift has been brought about by recent technological innovations: the association of information revolution and information technology seems self-evident. Thus, discussion of the Information Revolution is located within the history of technological development and the discourse of technological progress. This technological revolution, like the earlier Industrial Revolution, marks the opening of a new historical era. The terms 'industrial' and 'post-industrial' society - which, through a process of ideological elision, often translate into 'capitalist' and 'post-capitalist' - mark this transition from a period of constraint and limits, to one of freedom, democracy and abundance (Robins & Webster, 1999, p. 87). The novelty of Information Revolution is in new forms of information society activities raised on information society culture - one unique form of technoculture of 21st century produced by convergence of information and communications technologies.

These arguments open the paths for technoculture presumptions based on information and communication making social knowledge by information technology. Thus, technoculture is a characterization of contemporary cultures in which technology (especially but not only information and communications technology) has so deeply saturated into cultural practices that the two preciously distinct spheres (of technology and culture) are seen to be inseparable. In the same time, Green (2002) provides neutral definition of technoculture as the tools (information technology and appliances) of mediated communication through which cultural material is created and circulated. This approach avoids viewing technoculture as the nebulous and inevitable relationship between any form of technology and its cultural or social context. Similarly, it avoids a definition of technoculture that focuses exclusively on either the parties of control or resistance in the political economic spectrum. Technoculture, ultimately,

makes an argument for the usefulness of this term and its correlated theories for the study of technology, culture, and policy.

In the same time, cultural movements that have grappled with the complex relationship between technology, politics and culture raise the questions on how humanity might establish a more ethical relationship with the world (Cooper, 2002). With the information and converging technologies humans have been fascinated by the thought of transgressing the boundaries that seem to separate them from the rest of nature. Any culture reflects the ways it relates to nature. Our nature is technonature, and our culture is technoculture where cyborg acknowledges our mode of existence and destabilizes the traditional procedures of identity construction (Kull, 2002).

When we are speaking about culture in the modern age, it is obvious we must cope with the media. Never before has the future been so systematically envisioned, aggressively analyzed, and grandly theorized as in the present rush to cyberspace and digital. In the mid-twentieth century, questions about media technologies and society first emerged as scholarly hand-wringing about the deleterious sweep of electronic media and information technologies in mass culture (Caldwell, 2000). Now, questions about new technologies and their social and cultural impact are no longer limited to intellectual soothsayers in the academy but are pervasive parts of day-to-day discourses in newspapers, magazines, television, film, and digital media. All of these new digital media create the virtual portfolio. Virtual technologies have implications for knowledge, and consequently for the contemporary elites who live by knowledge. Although virtual world shifts to a consideration of the new virtual culture that has been taking shape through the 1990s, there is the argument that the virtual society is a pacified and managed space (Robins & Webster, 1999). Information technology, like language and social institutions, is integral to humanity itself, and technology must be treated as both a product of a

society and a culture, and as a force that conditions culture and society. Virtual culture empowered by virtual e-technologies has created a new and dynamic knowledge space that is being made about the enhancement of communication and community, and about the possibilities of virtual politics. Furthermore, some researchers suggest that cyberspace is one of the key instruments of collective intelligence. Collective intelligence is the synergy of skills, resources, and projects, the constitution and dynamic maintenance of shared memories, the activation of flexible and nonhierarchical modes of cooperation, the coordinated distribution of decision centers. It is “the enhancement, optimal use, and fusion of skill, imagination, and intellectual energy regardless of their qualitative diversity” (Lévy, 1997, p. 147). Put another way, cyberspace enables cooperative learning and collaboration empowering collective intelligence. “A collective intellect navigates within a moving universe: A cinemap is the product of this interaction. On the cinemap the informational universe (or databank) is not structured a priori (emphasis in the original), in keeping with some form of transcendent organization similar to that found in territorial space. It is not standardized by the use of statistical averages or distributions, as in commodity space. The cinemap integrates the qualitatively differentiated space containing the attributes of all the objects in the informational universe. The topological organization of this space expresses the variety of relations experienced by the objects or actors in this universe... Each member of the collective intellect can find his individual location on the cinemap” (Lévy, 1997, pp. 191,192).

Being aware of an organization’s culture at all levels is important because the culture defines appropriate and inappropriate behavior. In some cultures, for example, creativity is stressed. In others, the status quo is valued. Some cultures are more socially oriented, while others are task-oriented. In some companies, the teamwork is the key. In other words, individual achievement is

encouraged and valued. An organization's culture also determines the way in which employees are rewarded. Management tends to focus on a dominant source of motivation, such as pay, status, or opportunity for personal growth and achievement. The accessibility of management and the ways in which decisions are made are reflections of an organization's culture as well.

It is important for individual values to match organizational culture because a culture of shared meaning or purpose results in actions that help the group and organization achieve a common or collective goal. An organization will operate more productively as a whole when key values are shared among the majority of its members. High functioning organizations are comprised of individuals whose overt behaviors are consistent with their covert values. In order to keep this scenario for longer period, any society, group or organization need to be prepared to keep and preserve social knowledge corps - preserving social knowledge is the necessity for the society, and there will not be today's knowledge without appropriate forms of its preservation. Every community seeks and finds its own way for knowledge preservation, which in modern information society belongs to every individual that acts as a member of society.

INFORMATION TECHNOLOGY AND CULTURE CONVERGENCE TOWARDS NEW SOCIAL KNOWLEDGE: CONVERGENCE AXIS

Legacy and Scenarios

We should agree with the commonly accepted differentiation of data, information and knowledge. Data, derived from the Latin datum "that, which is given", as all kinds of sensorily perceptive phenomena in our social world, e.g. sounds, letters, figures, pictures, body movements, etc. At a certain point, data can suddenly become meaningful and thus relevant to an individual. At

this stage data becomes information, having the quality to give the information recipient a specific value compared to not receiving the information. Knowledge on its way seems to be a synthesis of perceived information, its cognitive processing and a certain actionable component, but in many theoretical approaches to information quality and knowledge management it remains vague, what exactly the social dimension of this transformationary process is.

Knowledge is embodied in people gathered in communities and networks. The road to knowledge is via people, conversations, connections and relationships. Knowledge surfaces through dialog, all knowledge is socially mediated and access to knowledge is by connecting to people that know or know whom to contact.

Personal stock of knowledge consists primarily of recipes on how to solve problems in social situations. With individual knowledge at hand individual is able to reduce or eliminate the problematic dimension of social situations to an extent that he or she becomes part of a social community. Schutz and Luckmann (1983) differentiate accordingly skills, useful knowledge and knowledge of recipes, depending on the degree of routinization of the respective type of knowledge. All these are (following Schutz' terminology) constructions of first degree, in the sense that they reflect our natural perception of the daily life-world. Constructions of second degree, then, are all sorts of theoretical knowledge about constructions of first degree, e.g. scientific theories and concepts. In order to get a clearer picture of Schutz' ontological framework of knowledge, we also have to look into the question of how the transformational process, which lets information become knowledge, is actually embedded in the social dimension. Here it is important to notice that individual knowledge is structured in a system of relevancies and typicalities, based on a subjective configuration of meaning. Schutz made a concise description of how knowledge is permanently valued and revalued according to individual's projections of acts, with which he or

she is trying to achieve certain goals. Thus, plan, act and knowledge go together and this pragmatic view on knowledge is central in conception of a social epistemology. The transformational process is then the process of acquiring knowledge out of information, which an individual is experiencing in daily life-world.

Knowledge itself is organization, produced by trial and error, and always subject to challenge, including changes in its form and relationships to other bodies of knowledge; it is a product as well as a precondition of decisions. Knowledge lies in the particular connections between elements, rather than the elements themselves; this is a concept foreign to microeconomics, in which connections are assumed to be complete except when the absence of a particular connection is identified as a source of market or organizational failure. Since technological innovation is an expression of the development of human knowledge, especially of knowledge how, an understanding of human knowledge provides a basis for understanding technological innovation - not least, because the power and fallibility of human imagination and human calculation seem to correspond to the remarkable successes and myriad failures of technology. It is also the combination of uncertainty. However, it also depends on the relationships, formal and informal, between individuals; knowledge depends on the organization of categories and the relationships between them; and the organization of people into categories and relationships, if appropriately managed, aids the development and use of knowledge in society.

Social knowledge allows a group to anticipate their strategies and to counter their hostile actions. Knowledge of the biochemical workings of deadly viruses can lead to neutralizing vaccines; knowledge of forthcoming meteorological disasters has produced wealthy investors in the futures commodities market; knowledge of emerging cultural trends can make or break those in the apparel, music, cinema, television, and novelty industries. This causal connection between knowledge and

society goes both ways: not only does society shape its knowledge but also the reverse holds have well.

It has been argued that some psychological and management theories and models may not be universal, and many which have been developed in industrialized countries, are based on some cultural assumptions (Hofstede, 2001; House et al., 2002). The term *etic* has been proposed to identify those psychological processes of human beings, which are universal. In contrast, the term *emic* has been suggested to classify those, which are culturally (socially) specific (Dastmalchian, Javidan, & Alam, 2001; Triandis, 1995). For example, it has been found that leadership attributions can be classified into *etic* and *emic* categories (Dastmalchian, et al., 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004). In addition, some have suggested that even similar psychological attributions across cultures may be manifested differently and be consistent with cultural factors. The *emic* and *etic* approaches suggest that the effectiveness of some theories or models to predict individuals' behaviors may be culturally and socially limited.

In recent history of information society, the additional category in the form of the cyborg has imposed itself upon through popular culture, and in sociological reflection within academia. The term cyborg or cybernetic organism, coined by Clynes and Kline (1960), was part of a proposal to technologically augment human beings to survive in harsh environments, in particular, astronauts. Drawing from this idea, popular culture has often portrayed the cyborg figure as the literal fusion of the biological human being with inorganic technology, often to the detriment of human identity and dignity. Alternatively, in the academic world the cyborg represents a metaphor for exploring contemporary technoculture, existing as a hybrid figure that forms a nexus where existing categories used to organize the world collapse and restructure themselves. In both cases, the cyborg inhabits in a new, constructed world that exists in the border-

lands of more familiar cultural and experiential terrain consisted invisible e-technologies.

Throughout of the history of information age it is also obvious that technology and culture have privileged the abstract as the Real, and have downplayed materiality. There are three major chronological stages, each addressed with its question. The first stage covers the period from 1945 to 1960 and brought the question on how did information lose its body. The second stage is from 1960-1980 stressed with the processes of embodiment with the question in place how did the cyborg become an icon. The human is seen as observer constructing an abstract notion of information in order to make sense of the world. Thus, here information does become specific to what the observer makes out of it. The third stage is from 1980 until now opening the process of virtuality, and poses the question how did we become Posthuman. Hayles (1999) rightly critiques the contemporary belief that the body is primarily a discursive and linguistic construction. Continuing the work in theory, in the sixties of the twentieth century, Berger and Luckmann (1966) have developed a comprehensive, influential sociological theory that emphasizes the social construction of what we refer to as our external world. In social interactions, it would be highly inefficient not to establish certain routines, which help us anticipate and structure social situations. Thus, we can observe a process of habituation as soon as an action is repeatedly carried out. In Schutz' terminology (1983) we are sedimenting knowledge of recipes, useful knowledge or skills of how to do certain things. Once these habituated actions are reciprocally objectivated by several actors, we can speak of a specific sequence of interaction having become a social institution. Institutions, thus, are something that has its own reality, a reality that is experienced by us as an external, binding fact, and every institution has a corresponding set of knowledge, which constitutes its semantical content. Knowledge, in this sense, is in the center of the fundamental dialectic of

society, in that it defines the guidelines, through which the process of externalization produces an objective reality. Nevertheless, at the same time knowledge is constantly being internalized as valid and true objectivations of the realm of reality consisted of information technology.

This process of internalization of knowledge is known as the process of socialization (Berger & Luckmann, 1966) and is basically a twofold process of experiencing the external world as a meaningful and social reality. The primary socialization is responsible for the internalization of typifications and social objectivations, out of which a specific system of relevancies is constructed, while the secondary socialization is providing role-specific knowledge in an ongoing process, which allows the individual to perform a varying set of social roles and to live in institutional finite provinces of meaning.

Knowledge once defined as human faculty resulting from interpreted information and understanding, evolves by combination of data, information, experience, and individual interpretation. In an organizational and social context, knowledge is the sum of what is known and what resides in the intelligence and the competence of people. In recent years, knowledge has come to be recognized as a factor of production (see knowledge capital) in its own right, and distinct from labor.

Modern science has been regarded as both a model of democratic self-governance and an activity requiring and facilitating democratic practices in its supporting social context (Popper, 1950; Bronowski, 1956). Their work should be encapsulated into research on information technology issues regarding social context. In this perspective, science (and knowledge) is seen as embedded in and dependent on its supporting social context, but insulated in its practices from the influence of that context. As the reach of science and science-based information technologies has extended further and further into the economy and daily life of information society, new attention is paid to the governance of science and technology. Regard-

less of one's views about the social character of knowledge, there are further questions concerning what research to pursue, what social resources to devote to it, who should make such decisions, and how they should be made. Some degree of work is done in order to provide more insight in social dimensions of knowledge where learning of an individual is not finalized without social activities (Turiel, 1983). These notions opened the space for technoethics and technoculture dimensions of social knowledge empowered with information technology use.

We live from birth to death in a world of persons and things that in large measure is what it is because of what has been done, and transmitted from previous human activities. When this fact is ignored, experience is treated as if it were something that goes on exclusively inside an individual's body and mind (Mueller, Carpendale, Budwig, & Sokol, 2008). It ought not to be necessary to say that experience does not occur in a vacuum. Understanding factors that enhance and diminish performance levels of individuals is therefore, a necessity for managing performance. Accordingly, a growing body of research in management and organizational psychology has proposed understanding performance by decomposing its constructs based on task-level and contextual-levels. Theories from Information Systems suggest understanding individual performance by examining the task-technology fit within organizational human resources. Others have suggested understanding performance by evaluating impacts of information technology on performance at different levels, namely at the task-productivity and communication-structure levels. These models however do not account for the importance of social processes that weave together a rich fabric of human or information-communications systems technology-enabled social and professional relationships that contribute largely towards performance.

With the pervasive growth of information and communications technologies, social network

studies now encompass computer supported cooperative networks, online communities and virtual teams in its realm of explaining social outcomes. When the information technology is the term of convergence, we are witnessed the first convergence of men, computer and organization science into information systems development process. Maturity of information systems design, deployment and recent development in ubiquitous and pervasive computing lead us into information age producing information technology based knowledge society.

This convergence was connected with intellectual manifesto of the systems movement in early 1950s. The manifesto urged for the importance of system thinking and system men asking for social knowledge as the root notion. The process of information systems deployment asks for new organizational procedures and administrative as well as management tools. In this context, Neuschel (1950) firmly subjugated his analysis of specific tools and work aids, such as surveys, flow charts, and tabulating machines, to this higher end. He wanted to turn a collection of specialized techniques into a much broader kind of explicitly managerial expertise. An open-ended procedures program carried out directly for the chief executive in order to improve corporate coordination would fit with system thinking, making it as predecessor of social knowledge techniques known through the Internet and Web based tools and system facilities. Neuschel's ideas spread among the more ambitious of the corporate systems men as well as the rapidly expanding body of management consultants.

Aligning with the social network perspective of perceiving individual outcomes as the consequence of network structure (Borgatti & Foster, 2003), there are theoretical frameworks for understanding individual performance in knowledge-intensive work by exploring its interplay between social network structure and information technology use. According to Wellman and his colleagues (Wellman et al., 1996), where

computer networks connect people, such networks are computer supported social networks. The use of information and communications technologies refers to the utilization of hardware or software for achieving task-oriented goals and includes computer-mediated communication over text, graphics or computer networks.

Manheim propounds the thesis that “even the categories in which experiences are subsumed, collected and ordered vary according to the social position of the observer.” (Mannheim, 1936, p. 130). An organically integrated group conceives of history as a continuous movement toward the realization of its ends. Socially uprooted and loosely integrated groups espouse a historical intuitionism. Intuitionism copes with the basic moral truths as objective ones; they hold independently of what anyone may think or feel following own basic moral intuitions. Hence, moral intuitions come largely from social conditioning, and vary greatly between cultures. The well-adjusted conservative mentality is averse to historical theorizing since the social order presents no problems. Only the questioning of the status quo by opposing classes leads conservatives to defensive philosophical and historical reflections concerning themselves and the social world. Furthermore, conservatism tends to view history in terms of morphological categories which stress the unique character of historical configurations, whereas advocates of change adopt an analytical approach in order to arrive at units which may be recombined, through causality or functional integration, into new wholes. The first view stresses the inherent stability of the social structure as it is; the second emphasizes changeability by abstracting the component elements of this structure and rearranging them anew.

These notions are of special interest in the context of computer-mediated communication within Internet user groups and social networks, accompanied with the facts that creating new knowledge comes from bringing forth new worlds, from agreeing and naming subtle signs, symptoms, patterns and perceptions that enable

alternative courses of action. Mostly this happens as a natural byproduct of conversations within groups. It is recognized by the issues, the values, and the beliefs, in the language of a community of practice, often encoded in the group talk that sets the community apart. Distinctions are closely related to ontologies and to making meaning. New insights arise at the boundaries between communities, connections and reflections, and they are the key to synthesis and access to new ideas. The learning potential of a community and society lies in maintaining a tension and a balance between core practices and active boundary processes. Identity and meaningfulness are the wellspring of creativity, sharing is a natural byproduct of belonging, since the learning and understanding is more about community than content.

Web 2/3.x and Social Media/ Networks Impacts on Convergence

Convergence is not simply an issue of technology, but also of culture and life style. In information technology environment, convergence is a term for the combining of personal computers, telecommunications, and television into a user experience that is accessible to everyone. As network convergence evolves, major challenges confront network developers. The demand for bandwidth is perhaps the most significant. As applications become more sophisticated and users exchange data of increasingly rich content, network resources can become overwhelmed. A key to effective network convergence therefore lies in the design, installation and maintenance of adequate hardware. Another challenge is the fact that the implementation of new technologies is limited by the extent to which investors and taxpayers are willing to support them. Still another key issue is the need for standards that ensure seamless operation with multiple end-user platforms and evolving communications modes. New technologies sometimes bring new types of traffic that place previously unknown demands on

network hardware, operating systems, resources and software.

Network convergence is the efficient coexistence of telephone, video and data communication within a single network. The use of multiple communication modes in a single network offers convenience and flexibility not possible with separate infrastructures. Network convergence is also called media convergence. Computer-television convergence is already underway with WebTV and Social Television, which pipe the World Wide Web to a slightly-modified TV set with a set-top box from an ordinary phone line and provides a degree of interactivity.

In general, convergence is a coming together of two or more distinct entities or phenomena. Convergence is increasingly prevalent in the information technology world. In this context, the term refers to the combination of two or more different technologies in a single device. Taking pictures with a cell phone and surfing the Web on a television are two of the most common examples of this trend. Convergence may influence consumers to accept new technologies. According to some studies, people who are not computer literate are more likely to embrace the Internet, video-on-demand, and so on if they can access these technologies through their televisions.

Something curious is happening on the World Wide Web (Web). It is undergoing a slow transformation from an abstract, chaotic, information Web in early days of Internet into a social hypertext and later into social hypermedia. The Web opens the paths to communicating idea, information, and knowledge. Since the beginning of the Web 2.x deployment that actualize the possibilities of Internet to broaden knowledge base in social environment, Web 2.x became tool and resource of importance to knowledge management. After Web 2.x proliferation, we are facing with the Web 3.x tern that reflects momentous change in the way we view the first stage of Web. The real potential avenues for the Web 3.x that rely on the social knowledge acceleration include semantic Web,

and real world Web. Both have gained new possibilities for social knowledge expansion dealing with the intensive use of information technology in a new cultural context. Following the current Web paradigm, it is obvious that the Web 2.x connects information and Social Software connects people. However, Semantic Web connects knowledge and the goal is to exploit true Metaweb that connects intelligence. When we reach this stage, we are in situations of reasonable and acceptable management of collective intelligence and entire social knowledge corps.

The real potential is in semantic Web, which creates web of information that is meaningful to technology. Most of the data that is currently hosted through the Web is in information silos that are accessible only with professional tools and skills. This scenario promoted the thinking about solutions for embedding semantic data into Web information structures through microformats. Microformats stands here as the mechanism for embedding semantic attributes into Web content through the application of simple, open and standardized formats. It is of importance to note that embracing with semantic Web requires knowledge workers to not only move beyond the physical and virtual documents but also requires them to start thinking of interacting with the information on the Web as a large information and knowledge source.

The Web has become a fundamental component of our technical and social infrastructure, providing platform for managing and interacting with information. The Web continues to evolve, and it becomes deeply intertwined with its relevance to real world of objects, actions, activities, and events. It creates the room for new form of Web structure as The Real-World Web. It is constructed through connecting the Web to the real world by a rich set of ubiquitous networked and embedded devices. The ability to directly address, access, and influence not just information, but almost any aspect of our physical environment will change our concepts of the connections between action, response, place and time. Such environment is

close to the ideas of ubiquitous memory and knowledge of humankind made by Web based multimedia social networks.

Web based multimedia social networks are very close to the memex idea deployed onto personal computers and information appliances with wikipedia and similar tools. Memex that used as idea of hyperlinked world content into something close to the universal/global social knowledge is the first insight into convergence paths related to the information technology and cultural and social impact. In the last decades, knowledge of mankind was growing rapidly. This made it exceedingly difficult for people to store, retrieve and communicate information in an efficient and intuitive manner. Bush (1945) realized the problem of information overload and came up with a visionary solution for storage, organization and retrieval of information - the Memory Extension (memex).

The memex is, in its origin, a machine for individual use that can supplement individual's memory and it is on the technoethics axis. The concept is in idea in increasing individual ability to think creatively and make it as a part of collective memory and collective intelligence (technoculture axis). In that way, convergence of technology and cultural modes of information use made the frame for hypermedia architectures with a classic three-tier mode. Application layer is on top taking care of presenting information to the user. Below this layer is the link layer that makes up the model of the system and takes care of managing structure and data and the linking process that is of importance to the communication process. It is the core of the associations and the information needed to represent these associations making the information structure. Data, on the other hand, refers to the actual content of a document. Finally, the storage component takes care of storing information ranging from just the structure to both structure and content of the documents, depending on the system. All of these three components are the convergence units in

entire process of social knowledge development based on information technology.

The transformation of the Web into a social hypertext has a number of interesting ramifications. Perhaps the most immediate and practical is that social hypertexts allow a fundamental shift in the way people search for and communicate information. Rather than composing queries for search engines or going to likely places to browse, people can instead pose the reasonable question: Who would know? Or, who would know someone who would know? Navigating from one personal page to another, we suddenly have a new sort of search strategy, although this sort of social navigation is new only in the context of computer-based social networks. It is an old and familiar way of finding things out in the real world. We are social beings, and social hypermedia provides the opening for us to use our immense store of social knowledge to make inferences about where to find information on the net. The ability to find out what someone else is doing, without mutual knowledge of what is happening, is a boon to both parties. This non-mutuality of knowledge is one of the characteristics that make social hypermedia different from direct forms of real-world communication.

A fundamental assumption of most social networks research is that performance is influenced by the interplay of both network structure and tie correlates, autonomous of the medium that conduct the relations. Most studies, pertaining to social networks and performance, have focused either on the impact of network structure or on the effect of differing tie strengths within organizational contexts (Feld, 1981; Burt, 1992; Cross & Cummings, 2004; Oh, Chung, & Labianca, 2004). However, most of these network studies have been conducted isolating the fact that contemporary new media play no significant role in the creation and maintenance of social ties.

The use of information technology does not influence individuals at the task level only but has also revolutionarized ways in which individuals communicate, acquire, share and utilize informa-

tion (Nardi, 2005). Sproull and Kiesler (1991) have documented such secondary effects or impacts of information technology use as sociological effects because it affects the ways people communicate. Their categorization is in line with Orlikowski's (1992) conceptualization of technology in that the recursive process of dual change occurs at both the individual and technological level and affects each other over time.

Previous studies have reported on how communications technologies have extended information reach and enabled acquisition of useful information for individuals (Constant, Kiesler, & Sproull, 1994) and occupational communities through weak ties (Pickering & King, 1995), despite lack of personal connections with others. Furthermore, individuals tap into online communities and portals where benefits of social support, influence and information advantages are plenty (Butler, 2001). The social influence model (Fulk, Schmitz, & Steinfield, 1990) starts with the basic assumption that individuals cognitively process stimuli. It argues that perceptions of information technology are subjective and socially constructed and can be determined to a substantial degree by the attitudes, statements, and behaviors of colleagues. Colleagues exert social influence through overt statements about characteristics of the media or tasks that individuals absorb mentally within their perceptions. The influence may also take place through observational learning (vicarious or social learning) from observing the experiences of others.

The social influence model postulates that for any application, an individual's use of information technology (appliances) is "a function of:

- a. Media evaluations (perceptions and attitudes);
- b. Experience and skills;
- c. Social influence in the form of direct statements by co-workers regarding the application, vicarious learning, group behavioral norms, and social definitions of rationality;

- d. Tasks evaluations; and
- e. Situational factors such as individual differences, facilitating factors, and constraints"
- f. (Fulk et al., 1990, p. 127).

Hence, knowledge becomes an asset for society and knowledge as its most basic level is derived from personal meaning and the understanding of the relationships to this meaning. These relationships are greatly influenced by culture, social experiences, and technological artifacts (Cunningham, 2005). Unlike capital and labor, knowledge strives to be a public good. Once knowledge is discovered and made public, there is zero marginal cost to sharing it with more users. Secondly, in the digital information world, the creator of knowledge finds it hard to prevent others from using it and the community also has the problem of preserving yet socially embedded knowledge.

KEEPING SOCIAL KNOWLEDGE FOR FUTURE

In the disciplines that we call the history of ideas, the history of science, the history of philosophy, the history of thought, and the history of literature, attention has been turned, on the contrary, away from vast unities like periods or centuries to the phenomena of rupture, of discontinuity (Foucault, 1972). Beneath the great continuities of thought, beneath the solid, homogeneous manifestations of a single mind or of a collective mentality and social knowledge, one is now trying to detect the incidence of interruptions in entire social knowledge preservation. One answer to these questions of information society history is under the project of a total history that seeks to reconstitute the overall form of a civilization, the principle material or spiritual of a society.

There are the notions of development and evolution that make it possible to group a succession of dispersed events, and to link them to one

and the same organizing principle, to master time through a perpetually reversible relation between an origin and a digital pair. There is the idea of spirit, which enables us to establish between the simultaneous or successive phenomena of a given period a community of meanings, symbolic links, interplay of resemblance and reflection, or which allows the sovereignty of collective consciousness to emerge as the principle of unity and explanation. It is also clear that this description of discourses is in opposition to the history of thought that by its nature is the part of social knowledge. A system of thought can be reconstituted only on the basis of a definite discursive totality. The analysis of thought is always allegorical in relation to the discourse that it employs.

At the other side, social knowledge empowered by information technology no longer consisted of a group of traditions, observations, and heterogeneous practices, but of a corpus of knowledge that presupposed the same way of looking at things, and organized as a series of descriptive statements communicating between individuals. These notions are in the context of making heritage that is under the preservation process aiming to preserve collective memory, heritage, and social knowledge itself.

In its traditional sense, heritage can be defined as all data (monuments, cultural and natural sites museum collections, archives, manuscripts, etc.), or practices that a society inherits from its past intended to preserve and transmit to future generations. Its aim is to constitute a common foundation of values and references on which society members can develop a feeling of membership and sharing of common social values. It is indeed the part of social knowledge corps in every society. The principles by which these assets are selected, rest on the fundamental characteristic of lasting value and significance. In the age of digital civilization, a significant part of digital heritage consists of the product of the digital reproduction of pre-existing works, which may consist of texts, images, sounds, or which may be of an audiovisual, graphic, pho-

tographic or cinematographic nature. This digital double does not claim to be an identical copy of the initial work, but only a representation of it: it is a snapshot, a print, and a trace at a given moment in time. The second component of digital heritage comes from data that exist only in digital form, whether they are Internet sites, electronic publications, multimedia productions, or cultural or scientific databases containing and organizing textual or graphic documents, sounds, still images or audiovisual or multimedia productions.

A large part of the vast amounts of information produced in the information society is born digital, and comes in a wide variety of formats: text, database, audio, film, image. For cultural institutions traditionally entrusted with collecting and preserving cultural heritage, the question has become extremely pressing as to which of these materials should be kept for future generations, and how to go about selecting and preserving them. This enormous collection of digital information may well be lost unless specific techniques and policies are developed to conserve it. Traditional preservation methods cannot be successfully applied as such to digital material for a variety of reasons.

Before the Internet developed, it was still possible to bide our time. Preserving these new disconcerting carriers in a more traditional form remained an option. Although digital technology was spreading very quickly to all spheres of life, it was possible to circumvent it: the virtual was still often just another stage in a circular process from reality to reality. With the Internet, the question is clear: the time is close when we will no longer go out from these virtual spaces in order to be able to use them. We still often print out documents on paper, because reading from paper still feels a little more comfortable. The Internet sharpens the issues of the digital world and heritage. It changes the preservation process and its meaning which comes us from the remotest of past ages when humans for the first time inscribed what they knew on objects that were longer-lasting than

they were, so that their memory could traverse the generations and reach us.

The digitization of all data produced by human intelligence, whatever their original form – the written word, sounds, fixed or moving images – simultaneously affects the process of creating content, the way in which content is disseminated, and the ways in which it can be preserved over time. This digitization is happening to a greater or lesser degree in all spheres of activity, in the production and marketing of goods and services, in artistic, intellectual and scientific creation, and in public administration. The effects of this on our modes of production of and access to culture and knowledge cannot yet be fully measured. In the same time, within the Internet sphere, (the elusive Web) the unity of the document is lost in hyperlinks, flow replaces the finished object, and traditional methods of collection or acquisition no longer apply.

Considered as the most democratic publishing medium ever, Internet deserves to be preserved as a whole as its pages and discussion forums can be considered a priceless mirror of society. However, there are technical problems in ensuring that the digital material that is saved in archives remains accessible in its original form. Software and hardware are constantly replaced by new generations of technology that ultimately become incompatible with their predecessors. This means that within just a few years, material - which often includes sound and moving graphics or pictures, as well as links to Internet sites and, or, databases - becomes inaccessible.

Being a symbolic creature, our experienced reality is largely shaped by the meaning of things, framed by the beliefs, ideals, and emotions carried by the commonly shared symbolic containers (language) and social knowledge. When these socially-constructed frameworks evolve to the point that they survive through time, we have the seeds of civilization.

Today, new media such as the Internet, digital technology and mobile communication technolo-

gies are making rapid and deep changes to many societies. They connect communities, which used to be excluded because of physical and cultural distance. We could even speculate and say that, without the development and social use of new media, there would not be economic, political and cultural globalization as we see today. New media have changed the relationship between media and audience, institutions and the public, authorities and the mass and forms of interaction among individuals. What they bring is not only freedom, agency and mobility, but also distance, alienation and cultural conflicts. To a certain extent, social problems concerning the introduction of new media are still coterminous with those of modernity. Social manifestations of the new media are reflections of the conditions of late modernity, or the radical re-alignment of global economic order, social institutions and cultural identities.

The use of information technology tools is a dual process: humans shape the world (including human culture) and humans are shaped through the use of tools. This means that humans are part of their world, and cannot step outside and view the world from the outside. As Cole points out: “traditional dichotomies of subject and object, person and environment, and so on, cannot be analytically separated and temporally ordered into independent and dependent variables.” (Cole, 1996, p. 103). The continual advancement of technology will be critical in determining whether humanity will evolve into a true global civilization or destroy itself in the next century. In the next hundred years, humanity could leap forward into a true global civilization - complete with a unified language, culture and planet-wide technological capability. With the development of sciences, technology and economy of countries, and the advancement of people’s cultural level, many countries gradually put more emphasis to the preservation of their cultural heritage. The whole society recognizes the importance to preserve human’s heritage and safeguard our spiritual homeland. However, with the rapid technology development, we are in front

of the new need to conserve our heritage from current information society.

Digital heritage is not just traditional heritage in digital form. It is something like the digital fabric of society consisting digital objects. Digital objects includes all forms of digital communication and digitized information/content - Websites, discussion lists, Email, SMS, MMS, IM, Blogs, Private and professional correspondence, Photographs and films, Music, Internet Radio and TV, Games. Thus, there are new forms of civilization artifacts that carry other forms of visible and invisible culture, social knowledge, and common sense. Modern culture is represented by the use and cultural significance of digital information objects, rather than by the objects themselves. These cultural objects as information age artifacts are characterized as global, heterogeneous, fluid and dynamic, interactive and collaborative, inter-related, fragmented, multimodal, embedded and contextually exposed. Digital objects of a specific type are embedded in a networked environment and cannot be separated from other object types. In the same time, the digital context is not defined by national production. However, it is defined by what a nation selects from global resources.

Hence, we need adequate techniques and tools preserving digital heritage of information and knowledge society. Traditional museum, libraries and similar institutions are not more suitable to cope with the digital heritage, and there is a need for digital repositories of whole social knowledge corps. These new knowledge/memory institutions for the digital society will preserve the digital fabric of information society alongside traditional archives, libraries and museums. Preserving the digital heritage is principally a joint public and private responsibility where specific and well-developed heritage institutions exist for specific types of culture, government and scientific information: museums, archives and libraries. These institutions are well on their way towards digital preservation, but the digital is a characteristic of almost all forms of cultural expression, well

beyond the boundaries of traditional forms of culture. To preserve this aspect of the modern world, we need a new type of heritage institution and actions for encouraging the establishment of digital heritage repositories.

It is of crucial importance for any organization or society trying to keep entire knowledge corps in a way of continuity, to capture the critical knowledge of each individual and to ensure the transfer of that knowledge to successor generations. However, many organizations plan for continuity by focusing on explicit knowledge, laid out in official procedures, steps and standards and contained in documents, databases and formal processes (Beazley, Boenisch, & Harden, 2002). While such information is important, companies must also strive to capture tacit or implicit knowledge, wisdom that is in possession of individuals and it is stored in the heads of individuals - this knowledge leaves the organization or society when individuals leave or die. The key to knowledge continuity is preserving the relationship and building a network to enable communication.

Personal identity and context are keys in all forms of knowledge work, and community is a prerequisite for continuous learning of individuals. There is assumption that knowledge needs negotiation imposed social values and reflection, separate knowledge from personal knowing and individual competence (Szmátka, Lovaglia, & Wysienska, 2002). Knowledge is situated and presented in social behavior (culture), inventions, and artifacts. Reification, as the conversion of abstract concepts into concrete understanding and work, changes the nature of objects turning them into knowledge artifacts (social objects). These artifacts, as the social objects of the information society, should be kept for new generations helping them to acquire, use and further develop social knowledge ecosystem.

CONCLUDING DISCUSSION

It is known presumption that knowledge was defined as the act or state of knowing, and clear perception of fact, truth, or duty. Furthermore, knowledge, which is the highest degree of the speculative faculties, consists in the perception of the truth of affirmative or negative propositions. In the entire information technology domination in acquisition, share, and preservation of knowledge, the traditional definition of knowledge as justified true belief should also be considered. In the same time, knowledge is a macro phenomenon, like an entire set of connections, and not a micro phenomenon, like a single connection that creates the understanding as an emergent property of the social network.

Knowledge is not just something that we are now conscious of, but consists of the dispositions we consciously use in understanding what now happens, and in conceiving the connection between us and the world in which we live. This notion opens the sphere of social epistemology in knowledge definition clearly showing the dependence of knowledge upon social position. Thus, social knowledge is of crucial importance in the era of information technology and new media that acts as promoter of new form of social knowledge creation, dissemination, and use. Today, new media such as the Internet, digital (information) technology and mobile communication technologies are making rapid and deep changes to our societies. They connect communities, which used to be excluded because of physical and cultural distance. We are witnessing the knowledge networks explosions, and we have large amounts of socially distributed knowledge and high degrees of specialization of the knowledge workers. Hence, assessment of social knowledge in this context is highly dependent on individual knowledge of knowledge workers and experts, who can add importance and truthfulness to given knowledge part or information base.

There are two broad approaches to the field of knowledge and society relation. The one is dealing with the social determination of knowledge searching the ways in which social organization influences people's beliefs and ideas. The second one is dealing with the social construction of reality where social reality is produced and communicated, and that knowledge itself shapes social organization. It is especially influenced by information technology development and its deeper deployment into society. These notions open the room for new ways of convergence in the information society where convergence is not simply an issue of technology, but also of culture and life style, social values and currently, of invisible e-technologies (digital technologies). In the context of the culture and its impact on social knowledge developed in conjunction with the information technology use, it is important to see communication as the basis of sharing knowledge processes. Previous research on the social impact of communications technologies has followed two distinct directions and has considered independently either the interpersonal communication or the mass communication. This place is slowly touched with the modeling social media (digital television and other types of new media) systems.

Hence, the new forms of social knowledge as well as of new forms of social networks become the scope of broad research. The goal is to find what issues are relevant and what direction should be taken in account to overcome misuses of information technology in acquiring, exchanging and keeping social knowledge repositories (at individual, group, national or international level). In the space where social knowledge is empowering by information-communications systems, the social knowledge is mostly dealing with the two core interaction systems. The one is about interaction between individual and technology and the other one is about interaction between society and technology. The first interaction system is defining technoethics component while the second interaction system is defining

technoculture component of social knowledge corps in an information society. These interactions open the new form of convergence, the social knowledge convergence. The principal idea on social knowledge convergence is the notion of a shared cognitive and social context that has to be established in order for the members of the Internet and new media community to negotiate shared meanings, and hence construct collective knowledge. In the process of the Technology and Society convergence analysis, the convergence model is built and presented here by Social Knowledge Convergence Triangle. Each node of the triangle presents modular integrity depending on current technology development, technology awareness, and particular modes of sharing and envisaging knowledge corps within entire culture environment. In this context, the Convergence Model is one of possible tools to determine and evaluate social knowledge. The model disposes relations within technology and culture as well as their impacts on individuals and society.

Each organization has its individual and collective knowledge that is product of technology and culture. When information technology is acting as the bearer of social knowledge, information technology professionals and corporate management have important role in the process of recognizing knowledge as organization's asset that is the product of interconnected nodes of information, people, tools, and social norms and values. Thus, every organization has to find its own culture portfolio residing in information technology use. Technology should be accepted in accordance with the entire cultural values and beliefs of an organization's members. Every individual with his or her learning models and acquired knowledge brings his or her share to organization's knowledge corps. All of these create new digital society heritage in which every digital connected individual involves.

With the development of sciences, technology and economy of countries, and the advancement of people's cultural level, many countries gradu-

ally put more emphasis to the preservation of their cultural heritage. The whole society recognizes the importance to preserve human's heritage and safeguard our spiritual homeland. However, with the rapid technology development, we are in front of the new need to conserve our heritage within new information society. In the context of Internet and social networks, every piece of information base is incorporated into digital objects. Digital objects of a specific type are embedded in a networked environment and cannot be separated from other object types. The digital is a characteristic of almost all forms of cultural expression in information society, and digital objects become the fabric of society. To preserve this aspect of the modern world, we need a new type of heritage institution and new forms of activities, tools, and techniques capable to solve this task successfully.

REFERENCES

- Argyris, C. (1982). *Reasoning, learning, and action: Individual and organizational*. San Francisco, CA: Jossey-Bass.
- Argyris, C., & Schon, D. (1996). *Organizational learning II: Theory, method, and practice*. Reading, MA: Addison-Wesley.
- Asveld, L., & Roeser, S. (Eds.). (2009). *The ethics of technological risk*. London: Earthscan.
- Bao, Z., & Xiang, K. (2006). Digitalization and global ethics. *Ethics and Information Technology*, 8, 41–47. doi:10.1007/s10676-006-9101-7
- Beazley, H., Boenisch, J., & Harden, D. (2002). *Continuity management. Preserving corporate knowledge and productivity when employees leave*. New York: John Wiley & Sons.
- Berger, P. L., & Luckmann, T. (1966). *The social construction of reality*. New York: Doubleday.

- Bijker, W. E. (2010). How is Technology Made?- That is the Question! *Cambridge Journal of Economics*, 34(1), 63–76. doi:10.1093/cje/bep068
- Borgatti, S. P., & Foster, P. C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29(6), 991–1013.
- Bronowski, J. (1956). *Science and human values*. New York: Harper and Bros.
- Bunge, M. (1977). Towards a Technoethics. *The Monist*, 60(1), 96–107.
- Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Bush, V. (1945). As we may think. *Atlantic Monthly*, 176(1), 101–108.
- Butler, B. S. (2001). Membership size, communication activity, and sustainability: A resource-based model of online social structures. *Information Systems Research*, 12(4), 346–362. doi:10.1287/isre.12.4.346.9703
- Caldwell, J. T. (Ed.). (2000). *Electronic media and Technoculture*. New Brunswick, NJ: Rutgers University Press.
- Clynes, M. E., & Kline, N. S. (1960). Cyborgs and space. In Gray, C. H. (Ed.), *The Cyborg Handbook* (pp. 29–33). New York: Routledge.
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- Constant, D., Kiesler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitudes about information sharing. *Information Systems Research*, 5(4), 400–421. doi:10.1287/isre.5.4.400
- Cooper, S. (2002). *Technoculture and critical theory: In the service of the machine?* New York, NY: Routledge. doi:10.4324/9780203167021
- Crocco, M. S. (2001). Leveraging constructivist learning in the social studies classroom. *Contemporary Issues in Technology & Teacher Education*, 3, 386–394.
- Cross, R., & Cummings, J. N. (2004). Tie and network correlates of individual performance in knowledge-intensive work. *Academy of Management Journal*, 47(6), 928–937. doi:10.2307/20159632
- Cummings, J. N. (2004). Work groups, structural diversity, and knowledge sharing in a global organization. *Management Science*, 50(3), 352–364. doi:10.1287/mnsc.1030.0134
- Cunningham, S. D. (2005). Knowledge and cultural capital. In Rooney, D., Hearn, G., & Ninan, A. (Eds.), *Handbook on the knowledge economy* (pp. 93–101). Cheltenham, UK: Edward Elgar.
- Dastmalchian, A., Javidan, M., & Alam, K. (2001). Effective leadership and culture in Iran: An empirical study. *Applied Psychology: An International Review*, 50, 532–558. doi:10.1111/1464-0597.00072
- Dewey, J. (1916). *Democracy and education*. Boston, MA: The Macmillan Company.
- Dewey, J. (1927). *The public and its problems*. New York: Holt.
- Drucker, P. (1959). The next decade in management. *Dun's Review and Modern Industry*, 74, 52–61.
- Drucker, P. (1982). *Age of discontinuity*. New York: Perennial Library.
- Eiseman, C. H. (Ed.). (1973). *The McGraw-Hill encyclopedia of world biography (Vol. 1-12)*. New York: McGraw-Hill.
- Emirbayer, M. (1997). Manifesto for a relational sociology. *American Journal of Sociology*, 103(2), 281–317. doi:10.1086/231209

- Feld, S. L. (1981). The focused organization of social ties. *American Journal of Sociology*, 86, 1015–1035. doi:10.1086/227352
- Fleury, S. C. (1998). Social Studies, trivial constructivism, and the politics of social knowledge. In Larochelle, M., Bednarz, N., & Garrison, J. (Eds.), *Constructivism and education* (pp. 156–172). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511752865.011
- Fleury, S. C. (2001). Reclaiming science for social knowledge. In Ross, E. W. (Ed.), *The Social Studies Curriculum* (pp. 255–275). Albany, NY: State University of New York Press.
- Floridi, L., & Sanders, J. (2003). Computer ethics: Mapping the foundationalist debate. *Ethics and Information Technology*, 4(1), 1–24. doi:10.1023/A:1015209807065
- Fosnot, C. T. (Ed.). (1996). *Constructivism: Theory, perspective, and practice*. New York: Teachers College Press.
- Foucault, M. (1972). *L'archéologie du savoir*. Paris: Gallimard.
- Freeman, L. C. (2004). *The development of social network analysis: A study in the sociology of science*. Vancouver: Empirical Press.
- Fulk, J., Schmitz, J., & Steinfield, C. W. (1990). A social influence model of technology use. In Fulk, J., & Steinfield, C. (Eds.), *Organizations and communication technology* (pp. 117–140). Newbury Park, CA: Sage.
- Galván, J. M. (2003). On Technoethics. *IEEE Robotics & Automation Magazine*, 10(4), 58–63.
- Gilder, G. (1994). *Life after television*. New York: W. W. Norton & Company.
- Gilder, G. (2000). *Telecosm: How infinite bandwidth will revolutionize our world*. New York: The Free Press.
- Goldman, A. (1995). Psychological, social and epistemic factors in the theory of science. In R. Burian, M. Forbes, & D. Hull (Eds.), *Proceedings of the 1994 Biennial Meeting of the Philosophy of Science Association* (pp. 277–286). East Lansing, MI: Philosophy of Science Association.
- Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *Management Information Systems Quarterly*, 19(2), 213–236. doi:10.2307/249689
- Green, L. (2002). *Technoculture: From alphabet to cybersex*. Crows Nest, NSW: Allen and Unwin.
- Guetzkow, H., & Simon, H. (1955). The impact of certain communication nets upon organization and performance in task-oriented groups. *Management Science*, 1(3/4), 233–250. doi:10.1287/mnsc.1.3-4.233
- Hayles, K. (1999). *How we became posthuman: Virtual bodies in cybernetics, literature and informatics*. Chicago, IL: University of Chicago Press.
- Haythornthwaite, C. (2002). Strong, weak, and latent ties and the impact of new media. *The Information Society*, 18, 385–401. doi:10.1080/01972240290108195
- Hofstede, G. (1993). Cultural constraints on management theories. *The Executive*, 7(1), 81–95.
- Hofstede, G. (2001). *Culture's consequences*. London: Sage Publications.
- House, R., Hanges, P., Javidan, M., Dorfman, P., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE Study of 62 Societies*. Thousand Oaks, CA: Sage Publications.
- House, R., Javidan, M., Hanges, P., & Dorfman, P. (2002). Understanding cultures and implicit leadership theories across the globe: An introduction to project GLOBE. *Journal of World Business*, 37(1), 3–10. doi:10.1016/S1090-9516(01)00069-4

- Hutchison, C. B. (2006). Cultural constructivism: The confluence of cognition, knowledge creation, multiculturalism, and teaching. *Intercultural Education, 17*(3), 301–310. doi:10.1080/14675980600841694
- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference, and consciousness*. Cambridge, MA: Harvard University Press.
- Jonas, H. (1979). *The imperative of responsibility: In search of ethics for the technological age*. Chicago, IL: Chicago University Press.
- Jonas, H. (1985). *On technology, medicine and ethics*. Chicago, IL: Chicago University Press.
- Katz, R. M. (2008). *The tower and the cloud: Higher education in the age of cloud computing*. Boulder, CO: EDUCAUSE.
- Kitcher, P. (2001). *Science, truth, and democracy*. New York: Oxford University Press. doi:10.1093/0195145836.001.0001
- Kraemer, K. L., & King, J. L. (1988). Computer-based systems for cooperative work and group decision making. *ACM Computing Surveys, 20*(2), 115–146. doi:10.1145/46157.46158
- Kull, A. (2002). Speaking Cyborg: Technoculture and Technonature. *Zygon, 37*(2), 279–288. doi:10.1111/0591-2385.00428
- Leavitt, H. (1951). Some effects of certain communication patterns on group performance. *Journal of Abnormal and Social Psychology, 46*, 38–50. doi:10.1037/h0057189
- Lévy, P. (1997). *Collective intelligence: Mankind's emerging world in cyberspace*. London: Plenum Press.
- Licoppe, C., & Smoreda, S. (2005). Are social networks technologically embedded?: How networks are changing today with changes in communication technology. *Social Networks, 27*(4), 317–335. doi:10.1016/j.socnet.2004.11.001
- Locke, J. (1689). An essay concerning human understanding. In K.P. Winkler (Ed.). (1996). Indianapolis, IN: Hackett Publishing Company.
- Luppigini, R. (2008). The emerging field of Technoethics. In Luppigini, R., & Adell, R. (Eds.), *Handbook of Research on Technoethics* (pp. 1–18). Hershey, PA: Idea Group Publishing.
- Malone, T., & Rockhart, J. (1991). Computers, networks, and the corporation. *Scientific American, 265*(3), 128–136. doi:10.1038/scientificamerican0991-128
- Mannheim, K. (1936). *Ideology and utopia: An introduction to the sociology of knowledge*. New York: Harcourt, Brace and Company.
- Markus, H. Z., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224–253. doi:10.1037/0033-295X.98.2.224
- Marsden, P., & Campbell, K. E. (1984). Measuring tie strength. *Social Forces, 63*, 482–501. doi:10.2307/2579058
- McLuhan, M. (1962). *The Gutenberg Galaxy*. London: Routledge & Kegan Paul.
- Metcalf, B. (1995). Metcalfe's law: A network becomes more valuable as it reaches more users. *InfoWorld, 17*(40), 53–54.
- Mill, J. S. (1859). *On liberty*. London: John W. Parker and Son. Harmondsworth: Penguin. Reprinted 1982
- Mitcham, C. (1997). *Thinking ethics in technology: Hennebach lectures and papers, 1995-1996*. Golden, CO: Colorado School of Mines Press.
- Mitcham, C. (Ed.). (2005). *Encyclopedia of science, technology, and ethics*. Detroit, MI: Macmillan Reference.
- Moore, E. G. (1965). Cramming more components onto integrated circuits. *Electronics, 38*(8), 114–117.

- Mueller, U., Carpendale, J., Budwig, N., & Sokol, B. (2008). *Social life and social knowledge: Toward a process account of development*. London: Psychology Press.
- Nardi, B. A. (2005). Beyond bandwidth: Dimensions of connection in interpersonal communication. *Computer Supported Cooperative Work, 14*, 91–130. doi:10.1007/s10606-004-8127-9
- Nardi, B. A., Whittaker, S., & Schwarz, H. (2000). It's not what you know: Work in the information age. *First Monday, 3*, 455–489.
- Neuschel, R. F. (1950). *Streamlining business procedures*. New York: McGraw-Hill.
- Oh, H., Chung, M. H., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *Academy of Management Journal, 47*(6), 860–875. doi:10.2307/20159627
- Orlikowski, W. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization Science, 3*(3), 398–427. doi:10.1287/orsc.3.3.398
- Peirce, C. S. (1878). How to make our ideas clear. *Popular Science Monthly, 12*, 286–302. Reprinted in P. Wiener (Ed.) (1958), *Selected Writings* (pp. 114–136). New York: Dover Publications.
- Phillips, D. C. (1995). The good, the bad, the ugly: The many faces of constructivism. *Educational Researcher, 24*(7), 5–12.
- Pickering, J. M., & King, J. L. (1995). Hardwiring weak ties: Interorganizational computer-mediated communication, occupational communities, and organizational change. *Organization Science, 6*(4), 479–486. doi:10.1287/orsc.6.4.479
- Popper, K. (1950). *The open society and its enemies*. Princeton, NJ: Princeton University Press.
- Popper, K. (1972). *Objective knowledge*. Oxford: Oxford University Press.
- Prawat, R. S. (1996). Constructivisms, modern and postmodern. *Educational Psychologist, 31*(3/4), 215–225. doi:10.1207/s15326985ep3103&4_6
- Richardson, G. P. (1991). *Feedback thought in social science and system theory*. Philadelphia, PA: University of Pennsylvania Press.
- Richardson, V. (2003). Constructivist pedagogy. *Teachers College Record, 105*(9), 1623–1640. doi:10.1046/j.1467-9620.2003.00303.x
- Robins, K., & Webster, F. (1999). *Times of the Technoculture: From the information society to the virtual life*. London: Routledge.
- Roman-Velazquez, J. (2005). An empirical study of organizational culture types and their relationship with the success of a knowledge management system and the flow of knowledge in the U.S. government and nonprofit sectors. In Stankosky, M. (Ed.), *Creating the discipline of knowledge management*. Oxford: Elsevier Butterworth-Heinemann. doi:10.1016/B978-0-7506-7878-0.50008-9
- Schein, E. H. (1993). On dialogue, culture, and organizational learning. *Organizational Dynamics, 22*(2), 40–51. doi:10.1016/0090-2616(93)90052-3
- Schutz, A., & Luckmann, T. (1983). *The structures of the life-world (Vol. 2)*. London: Heinemann.
- Senge, P. (1990). *The fifth discipline. The art and practice of the learning organization*. London: Random House.
- Senge, P., Kleiner, A., Roberts, C., & Ross, G. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. New York: Doubleday.
- Spencer, H. (1929). *Education: Intellectual, moral, and physical*. London: Watts.
- Sproull, L., & Kiesler, S. (1991). *Connections: New ways of working in the networked organization*. Cambridge, MA: MIT Press.

Surowiecki, J. (2004). *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies, and nations*. New York: Doubleday.

Szmatka, J., Lovaglia, M., & Wysienska, K. (2002). *The growth of social knowledge: Theory, simulation, and empirical research in group processes*. New York: Praeger Publishers.

Tavani, H. T. (2004). *Ethics and technology: Ethical issues in an age of information and communication technology*. Hoboken, NJ: John Wiley & Sons.

Triandis, H. (1995). *Individualism & Collectivism*. Boulder, CO: Westview Press.

Triandis, H., & Gelfand, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74, 118–128. doi:10.1037/0022-3514.74.1.118

Turiel, E. (1983). *The development of social knowledge: Morality and convention*. Cambridge: Cambridge University Press.

Vygotsky, L. S. (1978). *Mind and society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wellman, B., Salaff, J., Dimitrova, D., Garton, L., Gulia, M., & Haythornthwaite, C. (1996). Computer networks as social networks: Collaborative work, telework, and virtual community. *Annual Review of Sociology*, 22, 213–238. doi:10.1146/annurev.soc.22.1.213

Williams, R., & Edge, D. (1996). The social shaping of technology. *Research Policy*, 25, 856–899. doi:10.1016/0048-7333(96)00885-2

Windschitl, M. (2002). Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research*, 72(2), 131–175. doi:10.3102/00346543072002131

ADDITIONAL READING

Bateson, G. (1979). *Mind and nature. A necessary unity*. New York: Bantam.

Borgmann, A. (1984). *Technology and the character of contemporary life: A philosophical inquiry*. Chicago: University of Chicago Press.

Gibson, W. (1984). *Neuromancer*. London: Harper Collins.

Giere, R. N. (1991). Knowledge, values, and technological decisions: A decision theoretic approach. In Mayo, D. G., & Hollander, R. D. (Eds.), *Acceptable Evidence: Science and Values in Risk Management* (pp. 183–203). New York: Oxford University Press.

Ihde, D., & Selinger, E. (Eds.). (2003). *Chasing technoscience: Matrix for materiality*. Bloomington, IN: Indiana University Press.

Jasanoff, S. (2005). *Designs on nature: Science and democracy in Europe and the United States*. Princeton, NJ: Princeton University Press.

Jones, S. G. (Ed.). (1995). *CyberSociety: Computer-mediated communication and community*. Thousand Oaks, CA: Sage Publications.

Kaptelinin, V., & Nardi, B. A. (2006). (2006). *Acting with technology: Activity theory and interaction design*. Cambridge, MA: MIT Press.

Kertesz, A. (1993). *Artificial intelligence and the sociology of knowledge. Prolegomena to an integrated philosophy of science*. Frankfurt am Main: Peter Lang.

Landow, G. P. (Ed.). (1994). *Hyper/Text/Theory*. Baltimore, MD: John Hopkins University Press.

Mansell, R., & Wehn, U. (Eds.). (1998). *Knowledge societies: Information technology for sustainable development*. Oxford: Oxford University Press.

McCarthy, E. D. (1996). *Knowledge as culture. The new sociology of knowledge*. London: Routledge.

McIlroy, D. J. (1999). *Electronic commerce*. Wellington: Butterworth.

Mitcham, C. (1994). *Thinking through technology*. Chicago, IL: University of Chicago Press.

OECD. (1996). *The knowledge economy. Science, technology and industry outlook*. Paris: OECD Publishing.

Rouse, J. (1987). *Knowledge and power: Toward a political philosophy of science*. Ithaca, NY: Cornell University Press.

Szmatka, J., Lovaglia, M., & Wysienska, K. (2002). *The growth of social knowledge: Theory, simulation, and empirical research in group processes*. Westport, CT: Praeger Publishers.

Toffler, A. (1980). *The third wave*. New York: Morrow.

Verbeek, P. P. (2008). Cultivating humanity: Towards a non-humanist ethics of technology. In J.K.B. Olsen, E. Selinger, & S. Riis (Eds.), *New Waves in Philosophy of Technology* (pp. 241-266). Hampshire: Palgrave MacMillan.

Welbourne, M. (1981). The community of knowledge. *The Philosophical Quarterly*, 31(125), 302–314. doi:10.2307/2219401

Wertsch, J. V. (Ed.). (1985). *Culture, communication, and cognition: Vygotskian perspectives*. Cambridge: Cambridge University Press.

Wylie, A. (2002). *Thinking from things*. Los Angeles, CA: University of California Press.

KEY TERMS AND DEFINITIONS

Social Knowledge: The entire result of group work with knowledge embedded within group members building relationships and trust, deep dialog and creative abrasion. In the context of information technology, it could be also defined as the use of *social media* to create, transfer,

and preserve group, organizational, and society knowledge with a view to achieving the society vision. Shared meaning is the difference between personal knowing and acquired understanding or social knowledge. It is also knowledge about social world and knowledge transmitted to the individual by other person developing social experiences where social judgments are organized within domain of knowledge.

Social Media: A type of online media that expedites conversation where people are talking, participating, sharing, networking, and bookmarking online. Social media describes a new set of information technology tools that enable shared community experiences, both online and in person. A community, in this context, is a group of people with common interests who connect with one another to learn, play, work, organize and socialize. Communities can be large or small, local or global communicating within entire technoculture milieu. Social media includes the various online technology tools that enable people to communicate easily via the Internet to share information and resources. Social media is a multimedia by nature and can include text, audio, video, images, podcasts, and other multimedia communications.

Technoethics: A term coined in 1974 by the Mario Bunge to denote the special responsibilities of technologists and engineers to develop ethics as a branch of technology. It is of crucial importance to the new e-technologies (information and communication technologies).

Technoculture: Relationship between any form of technology and its cultural or social context with e-technologies tools of mediated communication through which cultural material is created and circulated. One critical element of technoculture is the importance of modern, new, and emerging communication technologies. Bordering dangerously close to technological determinism, technoculture theorists often attempt to explain contemporary culture in terms of communication. It presents a characterization of contemporary cultures in which technology (especially but not

Empowering Social Knowledge with Information Technology

only information and communication technology) has so deeply saturated into cultural practices that the two preciously distinct spheres (of technology and culture) are seen to be inseparable.

Information Technology: The broadest sense refers to both the hardware and software that are used to store, retrieve, transmit, and manipulate information. Information technology is also de-

finied as being the study, design, development, implementation support and/or management of any computer based information systems (The Information Technology Association of America). Information technology deals with using electronic computers and software to convert, store, protect, process, retrieve with security or transmit any previously digitized information.

Compilation of References

- (2002). *USAF*. Washington, D.C.: Air Force Information Strategy.
- Aadne, J. H., Krogh, G. V., & Roos, J. (1999). Representationism: The Traditional Approach to Cooperative Strategies. In Krogh, G. V., & Roos, J. (Eds.), *Managing Knowledge: Perspectives on Cooperation and Competition* (pp. 9–31). London: Sage Publications.
- Abley, M. (2005). *Spoken Here: Travels among threatened languages*. New York: First Mariner Books.
- Adler, N. J. (1983). Cross-Cultural Management Research: The Ostrich and the Trend. *Academy of Management Review*, 8(2), 226–232. doi:10.2307/257749
- Adler, N. J. (2002). *International Dimensions of Organizational Behavior* (4th ed.). Cincinnati, OH: South-Western.
- Afergan, M. (CTO of Akamai). (2008, March 8). How myspace is hurting your network. Retrieved from pcsympathy: <http://www.pcsympathy.com/2008/03/08/how-myspace-is-hurting-your-network/>
- Ahuja, G. (2000). Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study. *Administrative Science Quarterly*, 45(3), 425–455. doi:10.2307/2667105
- Akil, H., Campeau, S., Cullinan, W., Lechan, R., Toni, R., Watson, S., & Moore, R. (1999). Neuroendocrine system I: Overview—thyroid and adrenal axis. In Zigmond, M., Bloom, F., Landis, S., Roberts, J., & Squire, L. (Eds.), *Fundamentals of neuroscience* (pp. 1127–1150). New York: Academic Press.
- Alaimo, C.A. (2009, May 17). Facebook, Social Media Infiltrating US Military. *Arizona Daily Star*.
- Alavi, M., Kayworth, T. R., & Leidner, D. E. (2006). An empirical examination of influence on organizational culture on knowledge management practices. *Journal of Management Information Systems*, 22(3), 191–224. doi:10.2753/MIS0742-1222220307
- Alavi, M., & Tiwana, A. (2003). Knowledge management: The information technology dimension. In Easterby-Smith, M., & Lyles, M. A. (Eds.), *Handbook of organizational learning and knowledge management* (pp. 104–121). Malden, MA: Blackwell Publishing Ltd.
- Alavi, M. (2000). Managing organizational knowledge. In Zmud, R. W. (Ed.), *Framing the domains of IT management* (pp. 15–28). Cincinnati, OH: Pinnaflex Educational Resources.
- Allen, M. (2008). Web 2.0: An argument against convergence. *First Monday*, 13(3). Retrieved October 28, 2008 from <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2139/1946>
- Allen, S., Ure, D., & Evans, S. (2003). *Virtual Communities of Practice as Learning Networks: Executive Summary* (pp. 50). Brigham Young University Instructional Psychology and Technology Department: The MASIE Center.
- Alvesson, M. (2004). *Knowledge Work and Knowledge-Intensive Firms*. New York: Oxford University Press.
- Amen, D. G. (2005). *Making a good brain great*. New York: Harmony Books.

Compilation of References

- Anderson, J. R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Anderson, C. (2009). *Free: the future of a radical price*. New York: Hyperion.
- Anderson, C. (2006). *The Long Tail: Why the Future of Business Is Selling Less of More*. New York: Hyperion.
- Anderson, M. (2002). Measuring Intangible Value: The ROI of Knowledge Management. Retrieved July 12, 2004, from http://www1.astd.org/news_letter/november/Links/anderson.html
- Anderson, N. (2009, October 11). *100 years of big content among fearing technology -- in its own words*. Retrieved December 1, 2009, from Arstechnica website: <http://arstechnica.com/tech-policy/news/2009/10/100-years-of-big-content-fearing-technology-in-its-own-words.ars>
- Anderson, P. D. (2008, January 23). Social networking eats time and bandwidth (allegedly). Retrieved from Techlun: <http://techlun.ch/2008/01/23/social-networking-eats-time-and-bandwidth-allegedly/>
- Andreasen, N. C. (2005). *The creating brain: The neuroscience of genius*. New York: The Dana Foundation.
- Andriessen, D., & Van den Boom, M. (2007). East is East, and West is West, and (n)ever its intellectual capital shall meet. *Journal of Intellectual Capital*, 8(4), 641–652. doi:10.1108/14691930710830800
- Ang, Z., & Massingham, P. (2007). National culture and the standardization versus adaptation of knowledge management. *Journal of Knowledge Management*, 11(2), 5–21. doi:10.1108/13673270710738889
- Anklam, P. (2002). Knowledge management: the collaboration thread. [ASIST]. *Bulletin of the American Society for Information Science and Technology*, 28(6). Retrieved from http://www.providersedge.com/docs/km_articles/KM_-_The_Collaboration_Thread.pdf.
- Applegate, L. M., McFarlan, F. W., & McKenney, J. L. (1999). *Corporate Information Systems Management: Text and Cases* (5th ed.). USA: Irwin/McGraw-Hill.
- Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, 7(1), 64–77. doi:10.1108/13673270310463626
- Argyris, C., & Schon, D. A. (1996). *Organizational learning II; Theory, method, and practice*. Addison-Wesley Publishing Co.
- Argyris, C. (1982). *Reasoning, learning, and action: Individual and organizational*. San Francisco, CA: Jossey-Bass.
- Argyris, C., & Schon, D. (1996). *Organizational learning II: Theory, method, and practice*. Reading, MA: Addison-Wesley.
- Argyris, C. (1991/1998). Teaching smart people how to learn. In Harvard Business School Press (Eds.), *Harvard Business Review on Knowledge Management* (pp. 81-108)
- Armistead, C. (1999). Knowledge Management and Process Performance. *Journal of Knowledge Management*, 3(2), 143–154. doi:10.1108/13673279910275602
- Ascoli, G. A. (Ed.). (2002). *Computational neuroanatomy: Principles and methods*. Totowa, NJ: Humana Press. doi:10.1385/1592592759
- Ashwell, L. (2008). This is a guide to social media usability for Marketers. In McInnes, N. (Ed.), *Social Media Usability*. Brighton: Nixon McInnes.
- Asveld, L., & Roeser, S. (Eds.). (2009). *The ethics of technological risk*. London: Earthscan.
- Badaracco, J. (1991). *The Knowledge Link: How Firms Compete through Strategic Alliances*. Boston, MA: Harvard Business School Press.
- Balmisse, G. Meingan, D., & Passerini, K. (2008). Technology Trends in Knowledge Management Tools. In O'Sullivan, K. (Ed.), *Knowledge Management in Multinational Organizations* (pp. 152-165). Hershey, PA: Information Science Reference.
- Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs: Prentice Hall.

- Bao, Z., & Xiang, K. (2006). Digitalization and global ethics. *Ethics and Information Technology*, 8, 41–47. doi:10.1007/s10676-006-9101-7
- Barkai, I., & Samuel, Y. (2005). The use of organizational learning mechanisms: Environmental, managerial, and cultural correlates. Academy of Management, Best Conference Paper, 2005
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120. doi:10.1177/014920639101700108
- Bass, B. (1985). *Leadership and performance beyond expectations*. New York: Free Press.
- Baumann, P. (2010, March 28). Do pharmaceutical companies have social media anxiety disorder? Retrieved April 9, 2010, from Better Health: <http://getbetterhealth.com/do-pharmaceutical-companies-have-social-media-anxiety-disorder/2010.03.28>
- Bear, M. F., Connors, B. W., & Paradiso, M. A. (2001). *Neuroscience: Exploring the brain* (2nd ed.). Baltimore, MD: Lippincott Williams & Wilkins.
- Beazley, H., Boenisch, J., & Harden, D. (2002). *Continuity management. Preserving corporate knowledge and productivity when employees leave*. New York: John Wiley & Sons.
- Begley, S. (2007). *Train your mind change your brain: How a new science reveals our extraordinary potential to transform ourselves*. New York: Ballantine Books.
- Benetech. (2009, October 5). About Martus. Retrieved from Martus: <http://www.martus.org/>
- Bennet, A., & Bennet, D. (2004). *Organizational survival in the new world: The intelligent complex adaptive system*. Burlington, MA: Elsevier.
- Bennet, A., & Bennet, D. (2006a). Learning as associative patterning. *Vine*, 36(4), 371–376. doi:10.1108/03055720610716638
- Bennet, A., & Bennet, D. (2006b). Hierarchy as a learning platform. *Vine*, 36(3), 255–260. doi:10.1108/03055720610703515
- Bennet, A., & Bennet, D. (2007a). CONTEXT: The shared knowledge enigma. *Vine*, 37(1), 27–40. doi:10.1108/03055720710742007
- Bennet, A., & Bennet, D. (2008a). The fallacy of knowledge reuse. *Journal of Knowledge Management*, 12(5), 21–33. doi:10.1108/13673270810902911
- Bennet, A., & Bennet, D. (2009). Managing self in troubled times: Banking on self-efficacy. In *Effective Executive* (pp. 56–82). India: The Icfai University Press, India.
- Bennet, D. (2006). Expanding the knowledge paradigm. *Vine*, 36(2), 175–181. doi:10.1108/03055720610682979
- Bennet, D., & Bennet, A. (2008b). Engaging tacit knowledge in support of organizational learning. *Vine*, 38(1), 72–94. doi:10.1108/03055720810870905
- Bennet, D., & Bennet, A. (2008c). Associative patterning: The unconscious life of an organization. In Girard, J. P. (Ed.), *Building organizational memory*. Hershey, PA: IGI Global.
- Bennet, D., & Bennet, A. (2003). The rise of the knowledge organization. In Holsapple, C. W. (Ed.), *Handbook on Knowledge Management 1: Knowledge Matters* (pp. 6–20). Berlin, Heidelberg, New York: Springer-Verlag.
- Bennet, A., & Bennet, D. (2007b). *Knowledge mobilization in the social sciences and humanities: Moving from research to action*. Frost, WV: MQIPress.
- Berger, P. L., & Luckmann, T. (1966). *The social construction of reality*. New York: Doubleday.
- Berry, C. (2008). *Word to Play: A textual handbook for actors and directors*. London: Oberon Books.
- Berry, J. W. (1980). Marginality, Stress and Ethnic Identification in an Acculturated Aboriginal Community. *Journal of Cross-Cultural Psychology*, 1, 239–252. doi:10.1177/135910457000100303
- Berry, J. W. (1990). Psychology of Acculturation: Understanding Individuals Moving between Cultures. In Brislin, R. (Ed.), *Applied Cross-Cultural Psychology* (pp. 232–253). Newbury Park, CA: Sage Publications.

Compilation of References

- Bhagat, R. S., Kedia, B. L., Harveston, P. D., & Triandis, H. C. (2002). Cultural Variations in the Cross-Border Transfer of Organizational Knowledge: An Integrative Framework. *Academy of Management Review*, 27(2), 204–221. doi:10.2307/4134352
- Bijker, W. E. (2010). How is Technology Made?-That is the Question! *Cambridge Journal of Economics*, 34(1), 63–76. doi:10.1093/cje/bep068
- Blakemore, S., & Frith, Y. (2005). *The learning brain: Lessons for education*. Malden, MA: Blackwell.
- Bloom, H. (2000). *Global brain: The evolution of mass mind from the big bang to the 21st century*. New York: John Wiley & Sons.
- Boisot, M. (1995). *Information space: A framework for learning in organizations, institutions and culture*. London: Routledge.
- Borgatti, S. P., & Foster, P. C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29(6), 991–1013.
- Bourdieu, P. (1986). The forms of capital. In Richardson, J. (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). New York: Greenwood.
- Bourhis, R., Moiese, L., Perreault, S., & Senecal, S. (1997). Towards An Interactive Acculturation Model: A Social Psychological Approach. *International Journal of Psychology*, 32, 369–686. doi:10.1080/002075997400629
- Bower, B. (2010). Wired Science Online: No Lie! Your Facebook Profile Is the Real You. Retrieved from <http://www.wired.com/wiredscience/2010/02/no-lie-your-facebook-profile-is-the-real-you/>
- Bownds, M. D. (1999). *The biology of mind: Origins and structures of mind, brain, and consciousness*. Bethesda, MD: Fitzgerald Science Press.
- Bradley, P., & Charbonneau, D. (2004). Transformational Leadership: Something New, Something Old. *Canadian Military Journal*, 5(1), 7–14.
- Bronowski, J. (1956). *Science and human values*. New York: Harper and Bros.
- Brookfield, S. D. (1987). *Developing critical thinkers*. San Francisco, CA: Jossey-Bass.
- Brown, J. S., & Duguid, P. (2000). *The social life of information*. Boston, MA: Harvard Business Press.
- Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science*, 2(1), 40–57. doi:10.1287/orsc.2.1.40
- Brown, J. (1989). *The Rational and the Social*. London: Routledge.
- Brown, P., & Lauder, H. (2000). Human capital, social capital and collective intelligence. In Brown, S., Field, J., & Schuller, T. (Eds.), *Social capital: Critical perspectives* (pp. 226–242). Oxford University Press.
- Bruce, C. (2007). CIA gets in your Face(book). *Wired*. Retrieved from <http://www.wired.com/techbiz/it/news/2007/01/72545>
- Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Bryant, J. (2003). *The Six Dilemmas of Collaboration: Inter-organizational Relationships as Drama*. London: John Wiley & Sons.
- Bunge, M. (1977). Towards a Technoethics. *The Monist*, 60(1), 96–107.
- Burns, J. M. (1978). *Leadership* (1st ed.). New York: Harper & Row.
- Burns, J. M. (1978). *Leadership*. New York: Harper and Row.
- Burt, R. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Bush, V. (1945). As we may think. *Atlantic Monthly*, 176(1), 101–108.

- Butler, B. S. (2001). Membership size, communication activity, and sustainability: A resource-based model of online social structures. *Information Systems Research, 12*(4), 346–362. doi:10.1287/isre.12.4.346.9703
- Buzsaki, G. (2006). *Rhythms of the brain*. New York: Oxford University Press. doi:10.1093/acprof:oso/9780195301069.001.0001
- Byrne, B. M. (1988). Measuring Adolescent Self-Concept: Factorial Validity and Equivalency of the SDQ III Across Gender. *Multivariate Behavioral Research, 23*(7), 361–375. doi:10.1207/s15327906mbr2303_5
- Byrnes, J. P. (2001). *Minds, brains, and learning: Understanding the psychological and educational relevance of neuroscientific research*. New York: The Guilford Press.
- Caldwell, J. T. (Ed.). (2000). *Electronic media and Technoculture*. New Brunswick, NJ: Rutgers University Press.
- Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture*. San Francisco, CA: John Wiley and Sons, Inc.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. *Psychological Bulletin, 56*(2), 81–105. doi:10.1037/h0046016
- Carroll, D. (2009) United Breaks Guitars. Retrieved from <http://www.davecarrollmusic.com/story/united-breaks-guitars/>
- Casmir, F. L. (1993). Third-Culture Building: A Paradigm Shift For International and Intercultural Communication. *Communication Yearbook, 16*, 407–428.
- CBC News. (2008). Military warns soldiers not to post info on Facebook. Retrieved April 1, 2010 from <http://www.cbc.ca/canada/story/2008/02/25/facebook-military.html?ref=rss>
- Chan, D. (2002). Questions about Change over Time in Cross-Cultural Organizational Research. *Asia Pacific Journal of Management, 19*, 449–457. doi:10.1023/A:1016256122279
- Chaoming Song, Z. Q.-L. (2010). *Limits of Predictability in Human Mobility*. Washington, DC: Science Mag.
- Charteris-Black, J. (2007). *The Communication of Leadership: The Design of Leadership Style*. New York: Routledge.
- Chatti, M. A., Klamma, R., Jarke, M., & Naeve, A. (2007). The Web 2.0 Driven SECI Model Based Learning Process. In *Proceedings of ICALT, 2007*, 780–782.
- Chemers, M. M. (2000). Leadership Research and Theory: A Functional Integration. *Group Dynamics, 4*(1), 27–43. doi:10.1037/1089-2699.4.1.27
- Chen, L. Y., & Barnes, F. B. (2006). Leadership behaviors and knowledge sharing in professional service firms engaged in strategic alliances. *Journal of Applied Management and Entrepreneurship, 11*(2), 51–70.
- Chickering, A. W., Dalton, J. C., & Stamm, L. (2005). *Encouraging authenticity & spirituality in higher education*. San Francisco, CA: Jossey-Bass.
- Chinowsky, P., & Carillo, P. (2007). Knowledge management to learning organization connection. *Journal of Management Engineering, 23*(3), 122–130. doi:10.1061/(ASCE)0742-597X(2007)23:3(122)
- Chong, C. W., Holden, T., Wilhelmij, P., & Schmidt, R. A. (2000). Where Does Knowledge Management Add Value? *Journal of Intellectual Capital, 1*(4), 366–380. doi:10.1108/14691930010359261
- Choo, C. W. (2006). *The Knowing Organization: How Organizations Use Information to Construct Meaning, Create Knowledge, and Make Decision* (2nd ed.). New York: Oxford University Press.
- Choo, C. W., & Bontis, N. (2002). Knowledge, Intellectual Capital, and Strategy: Themes and Tensions. In Choo, C. W., & Bontis, N. (Eds.), *The Strategic Management of Intellectual Capital and Organizational Knowledge* (pp. 3–19). New York: Oxford University Press.
- Church, D. (2006). *The genie in your genes: Epigenetic medicine and the new biology of intention*. Santa Rosa, CA: Elite Books.

Compilation of References

- Churchill, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *JMR, Journal of Marketing Research*, 16(1), 64–73. doi:10.2307/3150876
- Ciborra, C. U., & Patriota, G. (1998). Groupware and teamwork in R&D; limits to learning and innovation. *R & D Management*, 28(1), 1–10. doi:10.1111/1467-9310.00080
- Claes, M. (2004). The Interaction between Organizational Culture and National Culture, presentation in *Organizational and Professional Cultures and Diplomacy*, Malta, 13-15 February.
- Clynes, M. E., & Kline, N. S. (1960). Cyborgs and space. In Gray, C. H. (Ed.), *The Cyborg Handbook* (pp. 29–33). New York: Routledge.
- Cohen, A. R., & Bradford, D. L. (1989). Influence without Authority: The Use of Alliances, Reciprocity and Exchange to Accomplish Work. *Organizational Dynamics*, 17(3), 4–18. doi:10.1016/0090-2616(89)90033-8
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- Coleman, J. S. (1994). *Foundations of Social Theory* (pp. 94–95). Watertown, MA: Harvard Business Press.
- Collins, H., Gordon, C., & Terra, J. C. (2006). *Winning at Collaboration Commerce: The Next Competitive Advantage*. Boston: Elsevier.
- Collison, Ch., & Parcell, G. (2004). *Learning to fly: Practical knowledge management from leading and learning organizations*. London: Capstone.
- ComScore. (2009, June 4). Press Release. Retrieved from comScore: http://www.comscore.com/Press_Events/Press_Releases/2009/6/Americans_Viewed_a_Record_16.8_Billion_Videos_Online_in_April
- Connelly, C. E., & Kelloway, E. K. (2003). Predictors of employees' perceptions of knowledge sharing cultures. *Leadership and Organization Development Journal*, 24(5/6), 294–301. doi:10.1108/01437730310485815
- Connor, K., & Prahalad, C. (1996). A resource-based theory of the firm: knowledge versus opportunism. *Organization Science*, 7, 477–501. doi:10.1287/orsc.7.5.477
- Constant, D., Kiesler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitudes about information sharing. *Information Systems Research*, 5(4), 400–421. doi:10.1287/isre.5.4.400
- Constant, D., Sproull, L., & Kiesler, S. (1996). The kindness of strangers: The usefulness of weak ties for technical advice. *Organization Science*, 7(2), 119–135. doi:10.1287/orsc.7.2.119
- Constant, D., Kiesler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitudes about information sharing. *Information Systems Research*, 5(4), 400–421. doi:10.1287/isre.5.4.400
- Cook, S. D. N., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science*, 10(4), 381–400. doi:10.1287/orsc.10.4.381
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-Experimentation: Design & Analysis Issues for Field Settings*. Boston, MA: Houghton Mifflin Company.
- Cook, S. D. N., & Brown, J. S. (2005). Bridging Epistemologies: The Generative Dance between Organizational Knowledge and Organizational Knowing. In Little, S., & Ray, T. (Eds.), *Managing Knowledge: An Essential Reader* (2nd ed., pp. 51–84). London: Sage Publications.
- Cooper, S. (2002). *Technoculture and critical theory: In the service of the machine?* New York, NY: Routledge. doi:10.4324/9780203167021
- Corlett, J. A. (1996). *Analyzing Social Knowledge*. Totowa: Rowman & Littlefield Publishers.
- Corlett, J. A. (2007). Analyzing Social Knowledge. *Social Epistemology*, 21(3), 231–247. doi:10.1080/02691720701674049
- Cox, T. J. (2001). *Creating the Multicultural Organization*. San Francisco: Jossey-Bass.

- Cox, J. F. (2003). Toward a Model of Shared Leadership and Distributed Influence in the Innovation Process. In Pearce, C. L., & Conger, J. A. (Eds.), *Shared Leadership: Reframing the Hows and Whys of Leadership* (pp. 48–68). Thousand Oaks, CA: Sage Publications.
- Cozolino, L. J. (2002). *The neuroscience of psychotherapy: Building and rebuilding the human brain*. New York: Norton.
- Cozolino, L. J. (2006). *The neuroscience of human relationships: Attachment and the developing social brain*. New York: W.W. Norton.
- Cozolino, L., & Sprockay, S. (2006). Neuroscience and adult learning. In Johnson, S., & Taylor, T. (Eds.), *The neuroscience of adult learning*. San Francisco, CA: Jossey-Bass.
- Craik, K. (1943). *The nature of explanation*. London: Cambridge University Press.
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2003). *Research design. Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124–130. doi:10.1207/s15430421tip3903_2
- Crocco, M. S. (2001). Leveraging constructivist learning in the social studies classroom. *Contemporary Issues in Technology & Teacher Education*, 3, 386–394.
- Cross, R., Borgatti, S., & Parker, A. (2004). Making invisible work visible: using social network analysis to support strategic collaboration. *California Management Review*, 44(2), 25–46.
- Cross, R., Parker, A., Prusak, L., & Borgatti, S. (2001). Knowing what we know: Supporting knowledge creation and sharing in social networks. *Organizational Dynamics*, 30(2), 100–120. doi:10.1016/S0090-2616(01)00046-8
- Cross, R., & Cummings, J. N. (2004). Tie and network correlates of individual performance in knowledge-intensive work. *Academy of Management Journal*, 47(6), 928–937. doi:10.2307/20159632
- Culture (2009). 3M – A Culture of Innovation. Retrieved from http://www.3m.com/us/office/postit/pastpresent/history_cu.html
- Cummings, J., Butler, B., & Kraut, R. (2002). The quality of online social relationships. *Communications of the ACM*, 45(7), 103–108. doi:10.1145/514236.514242
- Cummings, J. N. (2004). Work groups, structural diversity, and knowledge sharing in a global organization. *Management Science*, 50(3), 352–364. doi:10.1287/mnsc.1030.0134
- Cunningham, S. D. (2005). Knowledge and cultural capital. In Rooney, D., Hearn, G., & Ninan, A. (Eds.), *Handbook on the knowledge economy* (pp. 93–101). Cheltenham, UK: Edward Elgar.
- Dalkir, K., Bilodeau, E., & Wiseman, E. (2004). The value of networks. *International Journal of Knowledge, Culture and Change Management*, 4, 993–1000.
- Dalkir, K. (2007). Characterization of knowledge sharing channels on the Internet. In Bolisani, E. (Ed.), *Building the Knowledge Society on the Internet: Making Value from Information Exchange* (pp. 89–119). Idea Publishing Group.
- Dalkir, K. (2008). Computer-mediated knowledge sharing. In Bolisani, E. (Ed.), *Building the knowledge society on the Internet: Sharing and exchanging knowledge in networked environments* (pp. 89–109). Hershey, PA: Information Science Reference.
- Daloz, L. (1986). *Effective teaching and mentoring*. San Francisco, CA: Jossey-Bass.
- Daloz, L. (1999). *Mentor: Guiding the journey of adult learners*. San Francisco, CA: Jossey-Bass.
- Damasio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt Brace & Company.

Compilation of References

- Damasio, A. R. (2007). How the brain creates the mind. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain* (pp. 58–67). New York: Dana Press.
- Dastmalchian, A., Javidan, M., & Alam, K. (2001). Effective leadership and culture in Iran: An empirical study. *Applied Psychology: An International Review*, *50*, 532–558. doi:10.1111/1464-0597.00072
- Davenport, T., & Prusak, L. (1998). *Working knowledge*. Boston, MA: Harvard Business School Press.
- Davenport, H. T. (1997). *Information Ecology*. New York: Oxford University Press.
- Davenport, T., & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Harvard Business School Press.
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.
- Davenport, T. H., & Prusak, L. (2000). *Working Knowledge: How Organizations Manage what they Know*. Cambridge, MA: Harvard Business School Press.
- Davenport, T. H., De Long, D. W., & Beers, M. C. (1998). *Successful knowledge management projects, Winter 1998*, 43-57
- Davenport, T.H., & Short, J.E. (1990). The New Industrial Engineering: Information Technology and Business Process Redesign. *Sloan Management Review*, *31*(summer), 11-27.
- Davidow, W. H., & Malone, M. (1992). *The Virtual Corporation*. London: Harper Collins.
- Day, V. D., & Halpin, M. S. (2004). Growing Leaders for Tomorrow: An Introduction. In Day, D. V., Zaccaro, S. J., & Halpin, M. S. (Eds.), *Leader Development for Transforming Organizations: Growing Leaders for Tomorrow* (pp. 3–22). New Jersey: Lawrence Erlbaum Associates Publisher.
- Day, V. D., & Lance, E. C. (2004). Understanding the Development of Leadership Complexity through Latent Growth Modeling. In Day, V. D., Zaccaro, S. J., & Halpin, M. S. (Eds.), *Leader Development for Transforming Organizations: Growing Leaders for Tomorrow* (pp. 41–70). New Jersey: Lawrence Erlbaum Associates Publisher.
- De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *The Academy of Management Executive*, *14*(4), 113–127.
- Deal, T. E., & Kennedy, A. A. (1982). *Corporate Cultures: The Rites and Rituals of Corporate Life*. New York: Perseus Books Publishing, LLC.
- DeLong, D. W. (2000). Diagnosing Cultural Barriers to Knowledge Management. *The Academy of Management Executive*, *14*(4), 113–127.
- Despres, C., & Chauvel, D. (2000). A Thematic Analysis of the Thinking in Knowledge Management. In Despres, C., & Chauvel, D. (Eds.), *Knowledge Horizons: The Present and the Promise of Knowledge Management*. Boston, MA: Butterworth-Heinemann.
- Dewey, J. (1997). *Experience and education*. New York: Simon & Schuster. (Original work published 1938)
- Dewey, J. (1916). *Democracy and education*. Boston, MA: The Macmillan Company.
- Dewey, J. (1927). *The public and its problems*. New York: Holt.
- Dey, I. (1999). *Grounding Grounded Theory*. London: Academic Press.
- Dispatch, C. (2010). One of the Best Values Around—Only in the Dispatch. Retrieved from <http://www.dispatch.com/live/content/faq/exclusive.html>
- Dixon, N. (2000). *Common knowledge: How companies thrive by sharing what they know*. Boston: Harvard Business School Press.
- Dobbs, D. (2007). Turning off depression. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: Dana Press.

- DoD. (2005a). Capstone Concept for Joint Operations. Retrieved from http://www.dtic.mil/futurejointwarfare/concepts/approved_ccjov2.pdf
- DoD. (2005b). Net-Centric Operational Environment Joint Integrating Concept. Retrieved from http://www.dtic.mil/futurejointwarfare/concepts/netcentric_jic.pdf
- DoD. (2007). The Joint Operating Environment: The World Through 2030 and Beyond. Retrieved from <http://www.policefuturists.org/pdf/1May07JOE.pdf>.
- Dougherty, D. (1995). Managing your core competencies for corporate venturing. *Entrepreneurship Theory and Practice*, 19(3), 113–135.
- Douma, C. (2006, October 1). What Is Radical Trust? Retrieved from November 1, 2009, from Radical Trust website: <http://www.radicaltrust.ca/about/>
- Draper, N. R., & Smith, H. (1980). *Applied Regression Analysis* (2nd ed.). New York: John Wiley & Sons.
- Drucker, P. F. (1992). The new society of organizations. *Harvard Business Review*, 70(5), 95–104.
- Drucker, P. (1993). *Post-capitalist Society*. Oxford: Butterworth-Heinemann.
- Drucker, P. F. (2008). *The Essential Drucker: The Best of Sixty Years of Peter Drucker's Essential Writings on Management*. United Kingdom: Harper Collins.
- Drucker, P. (1959). The next decade in management. *Dun's Review and Modern Industry*, 74, 52–61.
- Drucker, P. (1982). *Age of discontinuity*. New York: Perennial Library.
- Dube, R. (2009, March). What Types of Social Networks Exist? Retrieved from Social Networking: http://socialnetworking.lovetoknow.com/What_Types_of_Social_Networks_Exist
- Earl, M. (2001). Knowledge Management Strategies: Toward A Taxonomy. *Journal of Management Information Systems*, 18(1), 215–233.
- Earley, P. C., & Gibson, C. B. (2002). *Multinational Work Teams: A New Perspective*. New Jersey: Lawrence Erlbaum Associates Publishers.
- Earley, P. C., & Singh, H. (1995). International and Intercultural Management Research: What's Next? *Academy of Management Journal*, 38(2), 327–340. doi:10.2307/256682
- Earley, P. C., Ang, S., & Tan, (2003). *Cultural Intelligence: Individual Interaction across Cultures*. California: Stanford University Press.
- Edelman, G. M. (2000). *A universe of consciousness: How matter becomes imagination*. New York: Basic Books.
- Edvinsson, L. (1997). Developing intellectual capital at Skandia. *Journal of Long Range Planning*, 30(3), 320–321, 366–373.
- Eiseman, C. H. (Ed.). (1973). *The McGraw-Hill encyclopedia of world biography (Vol. 1-12)*. New York: McGraw-Hill.
- Electronic Frontier Foundation. (2010). Panopticklick. Retrieved from <https://panopticklick.eff.org/>
- Chiu Chi-Yue et al. (2005). Cultural Competence: Dynamic Processes. In Elliot, A. J. (Ed.), *Handbook of Competence and Motivation* (pp. 489–504). The Guilford Press.
- Emirbayer, M. (1997). Manifesto for a relational sociology. *American Journal of Sociology*, 103(2), 281–317. doi:10.1086/231209
- Erez, M., & Gati, E. (2004). A Dynamic Multi-Level Model of Culture: From the Micro Level of the Individual to the Macro Level of a Global Culture. *Applied Psychology: An International Review*, 53(4), 583–598. doi:10.1111/j.1464-0597.2004.00190.x
- Eyesight. (2009). *Wikipedia*. Retrieved (2010, April 18) from <http://en.wikipedia.org/wiki/Eyesight>
- Facebook (2010) Facebook Statistics. Retrieved from <http://www.facebook.com/press/info.php?statistics>
- Facebook. (2009). Statistics. Retrieved from Facebook: <http://www.facebook.com/press/info.php?statistics>

Compilation of References

- Fatehi, K. (2008). *Managing Internationally: Succeeding in a Culturally Diverse World*. Thousand Oaks, CA: Sage Publications.
- Feld, S. L. (1981). The focused organization of social ties. *American Journal of Sociology*, 86, 1015–1035. doi:10.1086/227352
- Feldman, M. (1989). *Order without design: Information production and policy making*. Stanford, CA: Stanford University Press.
- Ferrano, G. P. (2006). *The Cultural Dimension of International Business*. New Jersey: Pearson Prentice Hall.
- Findlater, J. (2008). New Social Media Platform Helps Military Members With Relocation. American Forces Press Service. Retrieved April 1, 2010 from <http://www.defense.gov/news/newsarticle.aspx?id=52160>
- Fink, G., & Holden, N. (2007). Cultural Stretch: Knowledge Transfer and Disconcerting Resistance to Absorption and Application. In Pauleen, J. D. (Ed.), *Cross-Cultural Perspectives on Knowledge Management* (pp. 67–80). Westport, CT: Libraries Unlimited.
- Firestone, J. M., & McElroy, M. W. (2003). *Key Issues in the New Knowledge Management*. Burlington, MA: Butterworth-Heinemann.
- Firestone, J. M. (2001). Estimating Benefits of Knowledge Management Initiatives: Concepts, Methodology and Tools. *Journal of the KMCI*, 1(3), 110–129.
- Fleury, S. C. (1998). Social Studies, trivial constructivism, and the politics of social knowledge. In Laroche, M., Bednarz, N., & Garrison, J. (Eds.), *Constructivism and education* (pp. 156–172). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511752865.011
- Fleury, S. C. (2001). Reclaiming science for social knowledge. In Ross, E. W. (Ed.), *The Social Studies Curriculum* (pp. 255–275). Albany, NY: State University of New York Press.
- Floridi, L., & Sanders, J. (2003). Computer ethics: Mapping the foundationalist debate. *Ethics and Information Technology*, 4(1), 1–24. doi:10.1023/A:1015209807065
- Fontaine, M. (2001). Keeping communities of practice afloat. *Knowledge Management Review*, 4(4), 16–21.
- Fosnot, C. T. (Ed.). (1996). *Constructivism: Theory, perspective, and practice*. New York: Teachers College Press.
- Foucault, M. (1972). *L'archeologie du savoir*. Paris: Gallimard.
- Frantova, E., & Bergler, S. (2009, September 1). Automatic emotion annotation of dream diaries. In *Proceedings of the Fifth International Conference on Knowledge. Proceedings of K Cap Workshop: Analyzing Social Media to Represent Collective Knowledge*.
- Freeman, L. C. (2004). *The development of social network analysis: A study in the sociology of science*. Vancouver: Empirical Press.
- Friedman, T. L. (2006). *The World Is Flat: A Brief History of the Twenty-first Century*. New York: Farrar, Straus and Giroux.
- Frith, C., & Wolpert, D. (2003). *The neuroscience of social interaction: Decoding, imitating, and influencing the actions of others*. New York: Oxford University Press.
- Fukuyama, F. (1999). *The Great Disruption*. Simon & Schuster.
- Fulk, J., Schmitz, J., & Steinfield, C. W. (1990). A social influence model of technology use. In Fulk, J., & Steinfield, C. (Eds.), *Organizations and communication technology* (pp. 117–140). Newbury Park, CA: Sage.
- Fuller, S. (1987). On regulating what is known: A way to social epistemology. *Synthese*, 73(1), 145–183. doi:10.1007/BF00485445
- Galbraith, J., Downey, D., & Kates, A. (2002). How networks undergird the lateral capability of an organization—Where the work gets done. *Journal of Organizational Excellence*, Spring 2002, 67–78
- Galván, J. M. (2003). On Technoethics. *IEEE Robotics & Automation Magazine*, 10(4), 58–63.

- Gantz, J. F., Chute, C., Manfrediz, A., Minton, S., Reinsel, D., Schlichting, W., & Toncheva, A. (2008). The Diverse and Exploding Digital Universe an Updated Forecast of Worldwide Information Growth Through 2011 [White paper]. Retrieved from <http://www.emc.com/collateral/analyst-reports/diverse-exploding-digital-universe.pdf>
- Gardner, H. (2005). Multiple Lenses on the Mind. Paper presented at the ExpoGestion Conference, Bogota Colombia, May 25, 2005.
- Garelli, S. (2008). Retrieved from <http://www.imd.ch/>
- Gartner. (2009, September). Ultra Broadband to cause Bandwidth divide. Retrieved from Zdnetasia: <http://www.zdnetasia.com/news/internet/0,39044908,62057651,00.htm>
- Gates, B. (1999). *Business @ the speed of thought*. New York: Warner Books, Inc.
- Geisler, E. (2008). *Knowledge and Knowledge Systems: Learning from the Wonders of the Mind*. Hershey: IGI Publishing.
- George, M. S. (2007). Stimulating the brain. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: The Dana Foundation.
- Gergen, K. J. (1991). *The saturated self: Dilemmas of identity in contemporary life*. New York: Basic Books.
- Gibran, K. (1923). *The prophet*. New York: Alfred A. Knopf.
- Gilder, G. (1994). *Life after television*. New York: W. W. Norton & Company.
- Gilder, G. (2000). *Telecosm: How infinite bandwidth will revolutionize our world*. New York: The Free Press.
- Giles, J. (2005) Nature International Weekly Journal of Science – Special Report: Internet encyclopedias go head to head. Retrieved from <http://www.nature.com/nature/journal/v438/n7070/full/438900a.html>
- Gioia, D. A., & Poole, P. P. (1984). Script in organizational behavior. *Academy of Management Review*, 9(3), 449–459. doi:10.2307/258285
- Girard, J. P. (2010). Toward an Understanding of Social Knowledge. In Girard, J., & Girard, J. (Eds.), *Social Knowledge: Using Social Media to Know What You Know*. Hershey, PA: IGI Global.
- Girard, J. (2004). *Towards an understanding of enterprise dementia: An empirical examination of information anxiety among public service middle managers* (Doctoral Dissertation). Retrieved from Ebsco host (3134168)
- Girard, J. P., & Girard, J. L. (2009). *Call for papers – Social knowledge: Using social media to know what you know*. Retrieved September 24, 2009 from <http://www.igi-global.com/requests/details.asp?ID=613>
- Glaser, B., & Strauss, A. L. (1967). *The discovery of Grounded Theory: Strategies for qualitative research*. Chicago: Aldine Publishing Company.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Glisby, M., & Holden, N. (2002). Contextual Constraints in Knowledge Management Theory: The Cultural Embeddedness of Nonaka's Knowledge-Creating Company. *Knowledge and Management Process*, 10(2), 1–8.
- Glisby, M., & Holden, N. (2005). Applying Knowledge Management Concepts to the Supply Chain: How a Danish Firm Achieved a Remarkable Breakthrough in Japan. *The Academy of Management Executive*, 19(2), 85–89.
- Godin, S. (2008). *Tribes: we need you to lead us*. New York: Portfolio.
- Goffee, R., & Jones, G. (1998). *The character of a corporation*. New York: HarperCollins Publishers, Inc.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge Management: An Organizational Capabilities Perspective. *Journal of Management Information Systems*, 18(1), 185–214.

Compilation of References

- Goldberg, E. (2005). *The wisdom paradox: How your mind can grow stronger as your brain grows older*. New York: Penguin Group.
- Goldman, A. I. (1986). The Cognitive and Social Sides of Epistemology. In *PSA. Proceedings of the Biennial Meeting of the Philosophy of Science Association*, 2, 295–311.
- Goldman, A. (1995). Psychological, Social and Epistemic Factors in the Theory of Science. In M. Forbes & R. Burian (Eds.), *PSA 1994: Proceedings of the 1994 Biennial Meeting of the Philosophy of Science Association* (pp. 277-286). East Lansing, MI: Philosophy of Science Association.
- Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *Management Information Systems Quarterly*, 19(2), 213–236. doi:10.2307/249689
- Goodman, P. S., & Darr, E. D. (1996). Computer-aided systems for organizational learning. In Cooper, C. L., & Rousseau, D. M. (Eds.), *Trends in Organizational Behavior* (pp. 81–97). New York: John Wiley.
- Google. (2009). Corporate Information—Company Overview. Retrieved from <http://www.google.com/corporate/index.html>
- Google. (2010). Google Books Settlement Agreement. Retrieved from <http://books.google.com/googlebooks/agreement/faq.html>
- Gordon, & Iyar (2008). *Why Buy the Cow? How the on-demand Revolution powers the new knowledge economy*. Lulu.com.
- Gordon, C. Weir, A., & Haynes, K. (2009). Virtual Worlds – A Universe of Opportunity. Helix Commerce International Inc. Retrieved from www.helixvirtualworlds.com
- Gordon, J., Van Durme, B., & Schubert, L. (2009). Weblogs as a source for extracting general world knowledge. International Conference on Knowledge Capture archive. In *Proceedings of the Fifth International Conference on Knowledge. Poster session* (pp. 185-186).
- Gourlay, S. (2006). Conceptualizing Knowledge Creation: A Critique of Nonaka's Theory. *Journal of Management Studies*, 43(7), 1415–1436. doi:10.1111/j.1467-6486.2006.00637.x
- Graen, G., & Hui, C. (1996). Managing Changes in Globalizing Business: How to Manage Cross-Cultural Business Partners. *Journal of Organizational Change Management*, 9(3), 62–72. doi:10.1108/09534819610116637
- Graen, G. B., Hui, C., & Wakabayashi, M. (1996). Cross-Cultural Research Alliances in Organizational Research: Cross-Cultural Partnership-Making in Action. In Early, C., & Erez, M. (Eds.), *Cross-Cultural Research in I/O Psychology*. San Francisco, CA: Jossey-Bass.
- Graen, G. B., & Wakabayashi, M. (1994). Cross-Cultural Leadership-Making: Bridging American and Japanese Diversity for Team Change. In Triandis, H. C., Dunnette, M. D., & Hough, L. M. (Eds.), *Handbook of Industrial and Organizational Psychology (Vol. 4)*, pp. 415–446). New York: Consulting Psychologist Press.
- Grant, R. M. (1996a). Prospering in Dynamically-competitive Environments: Organizational Capability as Knowledge Integration. *Organization Science*, 7(4), 375–387. doi:10.1287/orsc.7.4.375
- Grant, R. M. (1996b). Towards a Knowledge-based Theory of the Firm. [Special Issue entitled Knowledge and the Firm]. *Strategic Management Journal*, 17(4), 109–122.
- Grant, R. M. (1997). Knowledge-based View of the Firm: Implications for Management Practice. *Long Range Planning*, 30(3), 450–454. doi:10.1016/S0024-6301(97)00025-3
- Grant, R. M., & Baden-Fuller, C. (1995). A Knowledge-based Theory of Inter-firm Collaboration. In *Academy of Management Best Papers Proceedings*.
- Gray, P. (2007). Knowledge and hype. *Information Systems Management*, 24, 271–276. doi:10.1080/10580530701404470
- Green, L. (2002). *Technoculture: From alphabet to cybersex*. Crows Nest, NSW: Allen and Unwin.

- Grisham, T. (2005). *Cross-Cultural Leadership, doctoral dissertation*. Retrieved December 1, 2007, from <http://adt.lib.rmit.edu.au/adt/uploads/approved/adt-VIT20061116.125205/public/02whole.pdf>
- Grote, G., & Weichbrodt, J. C. (2007). Uncertainty Management through Flexible Routines in a High-Risk Organization. *2nd Annual Cambridge Conference on Regulation, Inspection & Improvement-The End of Zero Risk Regulation: Risk Toleration in Regulatory Practice*. Cambridge, UK.
- Guetzkow, H., & Simon, H. (1955). The impact of certain communication nets upon organization and performance in task-oriented groups. *Management Science*, *1*(3/4), 233–250. doi:10.1287/mnsc.1.3-4.233
- Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Media International*, *46*(1), 3–16. doi:10.1080/09523980802588626
- Gurteen, D. (1998). Knowledge, creativity, and innovation. *Journal of Knowledge Management*, *2*(1), 5–13. doi:10.1108/13673279810800744
- Haghirian, P. (2006). Japan - Vorreiter im Wissensmanagement? (In German: Japan – Still leader in knowledge management?). *Wissensmanagement*, November 2006, 30-32.
- Hakki, C., Cankaya, H. C., & Moldovan, D. (2009). Method for extracting commonsense knowledge. International Conference on Knowledge Capture archive. In *Proceedings of the Fifth International Conference on Knowledge, Session* (pp. 57-64).
- Hampden-Turner, C. M., & Trompenaars, F. (2000). *Building Cross-Cultural Competence: How to Create Wealth from Conflicting Values*. West Sussex: John Wiley & Sons Ltd.
- Hansen, M. T., & von Oetinger, B. (2001). Introducing T-Shaped Managers: Knowledge Management's Next Generation. *Harvard Business Review*, *79*(3), 107–116.
- Harris, R. P. (2004). European Leadership in Cultural Synergy. *European Business Review*, *16*(4), 358–380. doi:10.1108/09555340410546991
- Hatch, M. (1993). The dynamics of organizational culture. *Academy of Management Review*, *18*(4), 657–693. doi:10.2307/258594
- Hawkins, J. with Blakeslee, S. (2004). *On intelligence: How a new understanding of the brain will lead to the creation of truly intelligent machines*. New York: Henry Holt & Company.
- Hayes, N., & Walsham, G. (2003). Knowledge sharing and ICTs: A relational perspective. In Easterby-Smith, M., & Lyles, M. A. (Eds.), *Handbook of organizational learning and knowledge management* (pp. 54–77). Malden, MA: Blackwell Publishing Ltd.
- Hayles, K. (1999). *How we became posthuman: Virtual bodies in cybernetics, literature and informatics*. Chicago, IL: University of Chicago Press.
- Haythornthwaite, C. (2002). Strong, weak, and latent ties and the impact of new media. *The Information Society*, *18*, 385–401. doi:10.1080/01972240290108195
- Hearn, G., & Foth, M. (2005). Action research in the design of new media and ICT systems. In Kwansah-Aidoo, K. (Ed.), *Current Issues in Communication and Media Research* (pp. 79–94). New York: Nova Science.
- Hedlund, G., & Nonaka, I. (1993). Models of knowledge management in the West and Japan. In Lorange, P. (Ed.), *Implementing strategic processes: Change, learning and co-operation* (pp. 117–145). Oxford, UK: Basil Blackwell.
- Heidegger, M. (1962). *Being and time*. New York: Harper & Row.
- Heifetz, R. A., Kania, J. V. & Kramer, M. R. (2004). Leading Boldly. *Stanford Social Innovation Review*, *Winter* (2), 3
- Hentschel, B., & Haghirian, P. (2010). Nonaka revisited: Can Japanese companies sustain their knowledge management processes in the 21st century? In Haghirian, P. (Ed.), *Innovation and change in Japanese management* (pp. 199–220). London: Palgrave MacMillan.

Compilation of References

- Heuer, C. (2007, February 28). *What is Social Media? No, really, WTF? Social Media Club*. Retrieved March 24, 2008, from Social Media Club website: <http://www2.socialmediacub.org/2007/02/28/what-is-social-media-no-really-wtf/>
- Hicks, R. C., Dattero, R., & Galup, S. D. (2007). A Metaphor for Knowledge Management: Explicit Islands in a Tacit Sea. *Journal of Knowledge Management*, 11(1), 5–16. doi:10.1108/13673270710728204
- Hitt, M. A. (2003). Strategic Leadership in Global Business Organizations: Building Trust and Social Capital. In Mobley, W. H., & Dorfman, R. W. (Eds.), *Advances in Global Leadership* (pp. 9–36). Oxford: Elsevier.
- Hofstede, G. (2001). *Culture's Consequences* (2nd ed.). California: Sage Publications.
- Hofstede, G. (1993). Cultural constraints on management theories. *The Executive*, 7(1), 81–95.
- Hofstede, G. (2001). *Culture's consequences*. London: Sage Publications.
- Hogg, M. A. (2001). A Social Identity Theory of Leadership. *Personality and Social Psychology Review*, 5(3), 184–200. doi:10.1207/S15327957PSPR0503_1
- Holden, L. N. (2002). *Cross-Cultural Management: A Knowledge Management Perspective*. Harlow: Financial Times.
- Holthouse, D. (1998). Knowledge management research issues. *California Management Review*, 40(3), 277–280.
- Hornett, A., & Stein, E. W. (2009). Advances in knowledge management: Mapping ideas that shape practice. In Jenex, M. E. (Ed.), *Knowledge management, organizational memory and transfer behavior: Global approaches and advancements* (pp. 43–60). Hershey, PA: IGI Global.
- Horvath, J. A. (1999). *Tacit knowledge in professional practice*. London: Laurence Erlbaum.
- House, R., Hanges, P., Javidan, M., Dorfman, P., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE Study of 62 Societies*. Thousand Oaks, CA: Sage Publications.
- House, R., Javidan, M., Hanges, P., & Dorfman, P. (2002). Understanding cultures and implicit leadership theories across the globe: An introduction to project GLOBE. *Journal of World Business*, 37(1), 3–10. doi:10.1016/S1090-9516(01)00069-4
- Huber, G. P. (1982). Organizational information systems: Determinants of their performance and behavior. *Management Science*, 28(2), 138–155. doi:10.1287/mnsc.28.2.138
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1), 88–115. doi:10.1287/orsc.2.1.88
- Hutchison, C. B. (2006). Cultural constructivism: The confluence of cognition, knowledge creation, multiculturalism, and teaching. *Intercultural Education*, 17(3), 301–310. doi:10.1080/14675980600841694
- Hyman, S. E. (2007). Diagnosing disorders. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: Dana Press.
- Ichijo, K., & Nonaka, I. (2007). Introduction: Knowledge as competitive advantage in the age of increasing globalization. In Ichijo, K., & Nonaka, I. (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 3–10). Oxford, New York: Oxford University Press.
- Iles, P. (1995). Learning to Work With Differences. *Personnel Review*, 24(6), 44–61. doi:10.1108/00483489510097958
- Imahori, T. T., & Lanigan, M. L. (1989). Relational Model of Intercultural Communication Competence. *International Journal of Intercultural Relations*, 13(3), 269–286. doi:10.1016/0147-1767(89)90013-8
- Inoue, T. (2007). Company management in the era of Web 2.0 - knowledge communities facilitate open innovation -. *Nomura Research Institute Papers*, 115.
- ITAC (2003). *Global Survey Predicts Upsurge in Telework*. (Telework News, Issue 3.3)
- Janz, B. D., & Prasarnphanich, P. (2003). Understanding the antecedents of effective knowledge management: The importance of a knowledge-centered culture. *Decision Sciences*, 34(2), 351–384. doi:10.1111/1540-5915.02328

- Jarvenpaa, S., & Staples, D. (2000). The use of collaborative electronic media for information sharing: an exploratory study of determinants. *The Journal of Strategic Information Systems*, 9, 129–154. doi:10.1016/S0963-8687(00)00042-1
- Jarvenpaa, S. L., & Staples, D. S. (2001). Exploring perceptions of organizational ownership of information and expertise. *Journal of Management Information Systems*, 18(1), 151–183.
- Jelinek, P. (2009). Marine Corps Bans Twitter, Facebook, Other Social Media Sites. *Huffington Post*. Retrieved April 1, 2010 from http://www.huffingtonpost.com/2009/08/04/marine-corps-bans-twitter_n_250939.html
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Jian, H. (2009, March 22). HeJian E-Commerce Consultant. Retrieved from chr00t: <http://www.chr00t.com/2009/03/php-vs-java-vs-ruby/>
- Johnson, S., & Taylor, K. (2006). *The neuroscience of adult learning: New directions for adult and continuing education*. San Francisco, CA: Jossey-Bass.
- Johnson, J. P., Lenartowicz, T., & Apud, S. (2006). Cross-Cultural Competence in International Business: Toward a definition and a model. *Journal of International Business Studies*, 37, 525–543. doi:10.1057/palgrave.jibs.8400205
- Johnson, S. (2006). The neuroscience of the mentor-learner relationship. In Johnson, S., & Taylor, K. (Eds.), *The neuroscience of adult learning: New directions for adult and continuing education*. San Francisco, CA: Jossey-Bass.
- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference, and consciousness*. Cambridge, MA: Harvard University Press.
- Johnston, R. (2008). Knowledge management in the Web 2.0 age. *Associations Now*, 57–61.
- Jonas, H. (1979). *The imperative of responsibility: In search of ethics for the technological age*. Chicago, IL: Chicago University Press.
- Jonas, H. (1985). *On technology, medicine and ethics*. Chicago, IL: Chicago University Press.
- Jovchelovitch, S. (2007). *Knowledge in Context: Representations, Community and Culture*. London: Routledge.
- Kalpic, B., & Bernus, P. (2006). Business Process Modeling through the Knowledge Management Perspective. *Journal of Knowledge Management*, 10(3), 40–56. doi:10.1108/13673270610670849
- Kandel, E. R. (2006). *In search of memory: The emergence of a new science of mind*. New York: W.W. Norton & Company.
- Katz, R. M. (2008). *The tower and the cloud: Higher education in the age of cloud computing*. Boulder, CO: EDUCAUSE.
- Kayes, D. C. (2005). Essential Competencies for Cross-Cultural Knowledge Absorption. *Journal of Managerial Psychology*, 20(7), 578–589. doi:10.1108/02683940510623399
- Kelly, J. (2002). *Knowledge Nirvana*. Fairfax, VA: Xulon Press.
- Kelly, K. (2008). Better Than Free [e-Book]. Retrieved from <http://changethis.com/search?action=search&query=better+than+free>
- Kimble, C., & Hildreth, P. (2005). Dualities, distributed communities of practice and knowledge management. *Journal of Knowledge Management*, 9(4), 102–113. doi:10.1108/13673270510610369
- Kingsley, M. (2002). Measuring the Return on Knowledge Management. Retrieved on July 14, 2004, from <http://www.llrx.com/features/kmroi.html>
- Kitamura, M. (2002). Using ubiquitous networks to create new services based on the commercial and public infrastructure. *Nomura Research Institute Papers*, 54.
- Kitcher, P. (2001). *Science, truth, and democracy*. New York: Oxford University Press. doi:10.1093/0195145836.001.0001

Compilation of References

- Knight, D. J. (1999). Performance Measures for Increasing Intellectual Capital. *Strategy and Leadership*, 27(2), 22–27. doi:10.1108/eb054632
- Kock, N. F. (2005). *Business Process Improvement Through E-collaboration: Knowledge Sharing Through The Use Of Virtual Groups*. Hershey, PA: Idea Group Publishing.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities and the replication of technology. *Organization Science*, 3, 383–397. doi:10.1287/orsc.3.3.383
- Kogut, B., & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies*, 24, 625–645. doi:10.1057/palgrave.jibs.8490248
- Kogut, B., & Zander, U. (1995). Knowledge, market failure and the multinational enterprise: A reply. *Journal of International Business Studies*, 26, 417–426. doi:10.1057/palgrave.jibs.8490182
- Kogut, B., & Zander, U. (1996). What do firms do? Coordination, identity and learning. *Organization Science*, 7, 502–518. doi:10.1287/orsc.7.5.502
- Koh, J., Kim, Y.-G., Butler, B., & Bock, G.-W. (2007). Encouraging participation in virtual communities. *Communications of the ACM*, 50(2), 68–74. doi:10.1145/1216016.1216023
- Kohlbacher, F., & Haghirian, P. (2007). Japan und das Wissen der Babyboomer (In German: Japan and the Babyboomers' Knowledge). *Wissensmanagement*, January 2007, p. 22-24.
- Kraemer, K. L., & King, J. L. (1988). Computer-based systems for cooperative work and group decision making. *ACM Computing Surveys*, 20(2), 115–146. doi:10.1145/46157.46158
- Kujawski, M. (2008). Military warns soldiers not to post info on Facebook. Retrieved April 1, 2010 from <http://www.mikekujawski.ca/category/statistics/page/3/>
- Kull, A. (2002). Speaking Cyborg: Technoculture and Technonature. *Zygon*, 37(2), 279–288. doi:10.1111/0591-2385.00428
- Kuntz, P. G. (1968). *The concept of order*. Seattle, WA: University of Washington Press.
- Kurzweil, R. (2005). *The singularity is near: When humans transcend biology*. New York: Viking.
- Kwansah-Aidoo, K. (Ed.). (2005). *Current Issues in Communications and Media Research*. New York: Nova Science.
- Larsen, H. T., Bukh, P. N. D., & Mouritsen, J. (1999). Intellectual Capital Statements and Knowledge Management: 'Measuring' 'Reporting' 'Acting'. *Australian Accounting Review*, 9(3), 15–26. doi:10.1111/j.1835-2561.1999.tb00113.x
- Laudan, L. (1984). The Pseudo-Science of Science? In Brown, J. (Ed.), *Scientific Rationality: The Sociological Turn* (pp. 41–74). Dordrecht, Holland: Reidel.
- Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate peripheral participation*. Cambridge: University Press.
- Leavitt, H. (1951). Some effects of certain communication patterns on group performance. *Journal of Abnormal and Social Psychology*, 46, 38–50. doi:10.1037/h0057189
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Touchstone.
- Lee, H., & Choi, B. (2003). Knowledge Management Enablers Processes and Organizational Performance: An Integrative View and Empirical Study. *Journal of Management Information Systems*, 20(1), 179–228.
- Lessig, L. (2004). *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*. New York: The Penguin Press.
- Lévy, P. (1997). *Collective intelligence: Mankind's emerging world in cyberspace*. London: Plenum Press.

- Licoppe, C., & Smoreda, S. (2005). Are social networks technologically embedded?: How networks are changing today with changes in communication technology. *Social Networks*, 27(4), 317–335. doi:10.1016/j.socnet.2004.11.001
- Liebowitz, J., Rubenstein-Montano, B., McCaw, D., Buchwalter, J., Browning, C., Newman, B., & Rebeck, K. Knowledge Management Methodology Team. (2000). The Knowledge Audit. *Knowledge and Process Management*, (1): 3–10. doi:10.1002/(SICI)1099-1441(200001/03)7:1<3::AID-KPM72>3.0.CO;2-0
- Liew, A. (2007). Understanding Data, Information, Knowledge and Their Inter-Relationship. *Journal of Knowledge Management Practice*, 8(2). Retrieved April 5, 2009 from <http://www.tlinc.com/articl134.htm>
- LinkedIn. (2009, September). About. Retrieved from LinkedIn: <http://press.linkedin.com/about>
- Llinas, R. R. (2001). *I of the vortex: From neurons to self*. Cambridge, MA: The MIT Press.
- Loasby, B. (1991). *Equilibrium and evolution: An exploration of connecting principles in economics*. Manchester, UK: Manchester University Press.
- Locke, J. (1689). An essay concerning human understanding. In K.P. Winkler (Ed.). (1996). Indianapolis, IN: Hackett Publishing Company.
- Luppigini, R. (2008). The emerging field of Technoethics. In Luppigini, R., & Adell, R. (Eds.), *Handbook of Research on Technoethics* (pp. 1–18). Hershey, PA: Idea Group Publishing.
- Lustig, W. M., & Koester, J. (1996). *Intercultural Competence: Interpersonal Communication across Cultures* (2nd ed.). HarperCollins College Publishers.
- Lyons, D. (2005). Attack of the blogs. *Forbes*, 14 November. Retrieved June 12, 2009, from <http://www.forbes.com/home/forbes/2005/1114/128.html>
- Mackin, J. A. (1997). *Community over chaos: An ecological perspective on communication ethics*. Tuscaloosa, Alabama: University of Alabama Press.
- Maddock, M., & Viton, R. (2009). The smart way to tap social media. Retrieved May 31, 2009 from http://www.businessweek.com/managing/content/may2009/ca20090526_882141.htm
- Madnick, S. E. (1991). The Information Technology Platform. In Morton, S. (Ed.), *The Corporation of the 1990s* (pp. 27–60). New York: Oxford University Press.
- Maes, P., & Mistry, P. (2009). Retrieved from TED talks – Pattie Maes and Pranav Mistry demo SixthSense. URL http://www.ted.com/talks/pattie_maes_demos_the_sixth_sense.html
- Malone, T. W. (2004). *The Future of Work: How the New Order of Business Will Shape Your Organization, Your Management Style and Your Life*. Watertown, MA: Harvard Business Press.
- Malone, T., & Rockhart, J. (1991). Computers, networks, and the corporation. *Scientific American*, 265(3), 128–136. doi:10.1038/scientificamerican0991-128
- Malone, T. W. (2006). What is collective intelligence and what will we do about it? Retrieved November 10, 2009, from MIT Center for Collective Intelligence website: <http://cci.mit.edu/about/MaloneLaunchRemarks.html>
- Manjoo, F. (2002). Flash: Blogging goes corporate. *Wired*, 9 May. Retrieved July 8, 2009, from <http://www.wired.com/news/culture/0,1284,52380,00.html>
- Mannheim, K. (1936). *Ideology and utopia: An introduction to the sociology of knowledge*. New York: Harcourt, Brace and Company.
- Manovich, L. (2009). The practice of everyday (media) life: From mass consumption to mass cultural production? *Critical Inquiry*, 35(2), 319–331. doi:10.1086/596645
- Mariano, S., & Casey, A. (2007). The individual process of knowledge retrieval: A case study of an American high-technology research, engineering and consulting company. *VINE: The Journal of Information and Knowledge Management Systems*, 37(3), 314–330.

Compilation of References

- Markus, H. Z., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224–253. doi:10.1037/0033-295X.98.2.224
- Marlow, D. C. (2009). Primates on Facebook. Retrieved from http://www.economist.com/sciencetechnology/displayStory.cfm?story_id=13176775
- Marsden, P., & Campbell, K. E. (1984). Measuring tie strength. *Social Forces*, 63, 482–501. doi:10.2307/2579058
- Martin, J. (2002). *Organizational Culture: Mapping the Terrain*. California: Sage Publications.
- Marton, F., & Booth, S. (1997). *Learning and awareness*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Mayer-Kress, G., & Barczys, C. (1995). The Global Brain as an Emergent Structure from the Worldwide Computing Network, and its Implications for Modeling. *The Information Society*, 11(1), 1–28. doi:10.1080/01972243.1995.9960177
- McLuhan, M. (1962). *The Gutenberg Galaxy*. London: Routledge & Kegan Paul.
- Merriam, S. B. (2001). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Mestre, M., Stainer, A., Stainer, L., & Strom, B. (1999). Visual communications - the Japanese experience. *Corporate communications. International Journal (Toronto, Ont.)*, 5(1), 34–41.
- Metcalfe, B. (1995). Metcalfe's law: A network becomes more valuable as it reaches more users. *InfoWorld*, 17(40), 53–54.
- Meyerson, D., & Martin, J. (1987). Culture Change: An Integration of Three Different Views. *Journal of Management Studies*, 24, 623–647. doi:10.1111/j.1467-6486.1987.tb00466.x
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, CA: Jossey-Bass.
- MIC. (2005). *Information and communications in Japan - White paper 2005*. Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan. Retrieved October 20, 2008 from <http://www.johotsusintokei.soumu.go.jp/whitepaper/eng/WP2005/2005-index.html>
- MIC. (2007). *Communications usage trend survey - Press release*. Ministry of Internal Affairs and Communications, Japan. Retrieved October 29, 2008 from http://www.johotsusintokei.soumu.go.jp/tsusin_riyou/data/eng_tsusin_riyou02_2007.pdf
- Microgeist. (2009, April 27). The 10 Types of Social Media Sites You Need to be on and why. Retrieved from Microgeist: <http://microgeist.com/2009/04/the-10-types-of-social-media-sites-you-need-to-be-on-and-why/>
- Microsoft. (2009). Oil and Gas Pros View Social Media as Important for Productivity, Collaboration; Yet Few Firms Have Tools in Place, New Survey Reports. Retrieved from <http://www.microsoft.com/presspass/press/2009/feb09/02-18OGSocialMediaPR.msp>
- Miko Matsumura (deputy CTO, SoftwareAG). (2009, March 20). Untangling 'Rube Goldberg' SOAs with Social Networking. Retrieved from ebizq: http://www.ebizq.net/blogs/soainaction/2009/03/soa_tribes.php
- Miles, R. E., & Snow, C. C. (1992). Causes of failure in network organizations. *California Management Review*, 34, 53–72.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: A sourcebook of new methods* (2nd ed.). Newbury Park, CA: Sage.
- Miles, D. (2009). Army Leverages Social Media to Promote Recruiting. American Forces Press Service. Retrieved April 1, 2010 from <http://www.defense.gov/news/newsarticle.aspx?id=55273>
- Mill, J. S. (1859). *On liberty*. London: John W. Parker and Son. Harmondsworth: Penguin. Reprinted 1982
- Mitcham, C. (1997). *Thinking ethics in technology: Hennebach lectures and papers, 1995-1996*. Golden, CO: Colorado School of Mines Press.

- Mitcham, C. (Ed.). (2005). *Encyclopedia of science, technology, and ethics*. Detroit, MI: Macmillan Reference.
- Molson Coors Fact Sheet. (n.d.). Retrieved from http://molsoncoors.com/templates/molson_coors/pdf/MCB_Fact_sheet.pdf
- Molson Corporate Responsibility Report. (n.d.). Retrieved from <http://molsoncoors.com/cr.report/>
- Molson Interview with Digital Social Media Leaders: Ferg Devins, Chief of Government and Public Affairs, Ross Buchanan Director of Digital and Relationship Marketing, and Tanya Hammer, PR and Web 2.0 Coordinator (2009).
- Moody, J., & White, D. R. (2003). Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups. *American Sociological Review*, *68*(1), 103–127. doi:10.2307/3088904
- Moon, J. A. (2004). *A handbook of reflective and experiential learning: Theory and practice*. New York: Routledge Falmer.
- Moore, E. G. (1965). Cramming more components onto integrated circuits. *Electronics*, *38*(8), 114–117.
- Moran, R. T., Harris, P. R., & Moran, S. V. (2007). *Managing Cultural Differences: Global Leadership Strategies for the 21st Century* (7th ed., pp. 231–259). Oxford: Elsevier Inc.
- Motohashi, K. (2003). The Japanese model: Shifts in comparative advantage due to the IT revolution and modularization. *Journal of Japanese Trade and Industry*, 30-35.
- MPHPT. (2004). *Information and communications in Japan - White paper 2004*. Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan. Retrieved October 29, 2008 from <http://www.soumu.go.jp/english/wp/wp2004.html>
- Mroczkowski, T., and Hanaoka, M. (1998). The end of Japanese management: How soon? *Human resource planning*, *21*(3), 20-30.
- Mueller, U., Carpendale, J., Budwig, N., & Sokol, B. (2008). *Social life and social knowledge: Toward a process account of development*. London: Psychology Press.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, *23*(2), 242–266. doi:10.2307/259373
- Nardi, B. A. (2005). Beyond bandwidth: Dimensions of connection in interpersonal communication. *Computer Supported Cooperative Work*, *14*, 91–130. doi:10.1007/s10606-004-8127-9
- Nardi, B. A., Whittaker, S., & Schwarz, H. (2000). It's not what you know: Work in the information age. *First Monday*, *3*, 455–489.
- National Research Council. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Nelson, R., & Winter, S. (1982). *An evolutionary theory of economic change*. Cambridge, MA: The Bellhop Press of Harvard University Press.
- Nelson, K. M., & Coopridge, J. G. (1996). The Contribution of Shared Knowledge to IS Group Performance. *Management Information Systems Quarterly*, *20*(4), 409–429. doi:10.2307/249562
- Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied Linear Statistical Models*. USA: Irwin.
- Neuschel, R. F. (1950). *Streamlining business procedures*. New York: McGraw-Hill.
- Nguyen, T. B. N., & Umemoto, K. (2009). Understanding Leadership for Cross-Cultural Knowledge Management. *The Journal of Leadership Studies*, *2*(4), 23–35. doi:10.1002/jls.20078
- Nguyen, T. B. N., Umemoto, K., & Medeni, T. (2007). Towards a Theoretical Model of Cross-Cultural Knowledge Management. *International Journal of Knowledge, Culture and Change Management*, *7*(9), 33–40.
- Nguyen, T. B. N., Umemoto, K., Nakamori, Y., & Ito, Y. (2009). Culture as Knowledge. *The International Journal of Knowledge, Culture and Change Management*, *8*(9), 109–118.

Compilation of References

- Nguyen, T. B. N. (2007). Knowledge Management from Organizational Culture Perspectives. In *Proceedings of The 2nd International Conference on Knowledge, Information and Creativity Support Systems* (pp. 9-13). KICSS2007, Ishikawa, Japan.
- Nicolelis, M. A. L., & Chapin, J. K. (2007). Controlling robots with the mind. In Bloom, F. E. (Ed.), *Best of the brain from Scientific American: Mind, matter, and tomorrow's brain*. New York: Dana Press.
- Nielsen. (2009). Global Faces and Networked Places: A Nielsen report on Social Networking's New Global Footprint.
- Nishida, T. (2002). A traveling conversation model for dynamic knowledge interaction. *Journal of Knowledge Management*, 6(2), 124–134. doi:10.1108/13673270210424657
- Nomura, T. (2002). Design of “ba” for successful knowledge management – how enterprises should design the places of interaction to gain competitive advantage. *Journal of Network and Computer Applications*, 25(4), 263–278. doi:10.1006/jnca.2002.0139
- Nonaka, I., & Toyama, R. (2005). The theory of the knowledge-creating firm: subjectivity, objectivity and synthesis. *Industrial and Corporate Change*, 14(3), 419–436. doi:10.1093/icc/dth058
- Nonaka, I., Von Krogh, G., & Voelpel, S. (2006). Organizational knowledge creation theory: Evolutionary paths and future advances. *Organization Studies*, 27(8), 1179–1208. doi:10.1177/01708406060666312
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
- Nonaka, I. (1994). A dynamic theory of the organizational knowledge creation. *Organization Science*, 5(1), 14–37. doi:10.1287/orse.5.1.14
- Nonaka, I. (1991). The Knowledge-Creating Company. *Harvard Business Review*, 69(6), 96–104.
- Nonaka, I., Toyama, R., & Konno, N. (2002). SECI, Ba and Leadership: A Unified Model of Dynamic Knowledge Creation. In Little, S., Quitas, P., & Ray, T. (Eds.), *Managing Knowledge: An Essential Reader* (pp. 23–50). London: Sage Publication.
- Nonaka, I., Toyama, R., & Konno, N. (2001). SECI, ba and leadership: A unified model of dynamic knowledge creation. In Nonaka, I. (Ed.), *Managing industrial knowledge: creation, transfer and utilization* (pp. 13–43). London: SAGE Publications.
- Nonaka, I., & Toyama, R. (2004). Knowledge Creation as a Synthesizing Process. In Takeuchi, H. and Nonaka, I. (Eds.), *Hitotsubashi on Knowledge Management* (pp.91-124). Singapore: John Wiley & Sons (Asia).
- Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill.
- O’Dell, C., & Grayson, C. J. Jr. (1998). *If only we know what we know*. New York: The Free Press.
- Oakes, J., & Lipton, M. (1999). *Teaching to change the world*. Boston, MA: McGraw Hill College.
- Oh, H., Chung, M. H., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *Academy of Management Journal*, 47(6), 860–875. doi:10.2307/20159627
- Oliver, C. (1997). Sustainable Competitive Advantage: Combining Institutional and Resource Based Views. *Strategic Management Journal*, 18(9), 697–713. doi:10.1002/(SICI)1097-0266(199710)18:9<697::AID-SMJ909>3.0.CO;2-C
- Olivera, F. (2000). Memory systems in organizations: An empirical investigation of mechanisms for knowledge collection, storage and access. *Journal of Management Studies*, 37(6), 811–832. doi:10.1111/1467-6486.00205
- Ong, W. J. (2002). *Orality and literacy: The technologizing of the word*. New York: Rutledge Taylor & Francis Group.

- Onishi, A. (2009). Knowledge management. In Haghirian, P. (Ed.) *J-management; fresh perspectives on the Japanese firm in the 21st century* (pp. 204-225). Bloomington: iUniverse Star.
- Online, C. F. A. X. (2009). Canadian Forces and Social Media Make Interesting Bedfellows. Retrieved April 1, 2010 from <http://www.cfaxonline.com/?p=929>
- Orlikowski, W. J. (1993). Learning from notes: Organizational issues in groupware implementation. *The Information Society*, 9(3), 237–250. doi:10.1080/01972243.1993.9960143
- Orlikowski, W. J. (1996). Improving organizational transformation over time: A situated change perspective. *Information Systems Research*, 7(1), 63–92. doi:10.1287/isre.7.1.63
- Orlikowski, W. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization Science*, 3(3), 398–427. doi:10.1287/orsc.3.3.398
- O’Sullivan, S. L. (1999). The Distinction between Stable and Dynamic Cross-Cultural Competencies: Implications for Expatriate Trainability. *Journal of International Business Studies*, 30(4), 709–725. doi:10.1057/palgrave.jibs.8490835
- Ozuem, W., Howell, K. E., & Lancaster, G. (2008). Communicating in the new interactive marketplace. *European Journal of Marketing*, 42(9/10), 1059–1083. doi:10.1108/03090560810891145
- Palfrey, J., & Gasser, U. (2008). *Born Digital: Understanding the First Generation of Digital Natives*. Cambridge, MA: Basic Books.
- Pan, S., & Scarbrough, H. (1998). A Socio-technical View of Knowledge-sharing at Buckman Laboratories. *Journal of Knowledge Management*, 2(1), 55–66. doi:10.1108/EUM0000000004607
- Papadopoulos, S., Kompatsiaris, Y., & Vakali, A. (2009, September 1). Leveraging Collective Intelligence through Community Detection in Tag Networks. In *Proceedings of K Cap workshop Analyzing Social Media to Represent Collective Knowledge*.
- Papoutsakis, H., & Salvador Valles, R. (2006). Linking Knowledge Management and Information Technology to Business Performance: A Literature Review and a Proposed Model. *Journal of Knowledge Management Practice*, 7(1).
- Parker, M. G. (1994). *Cross-Functional Teams: Working with Allies, Enemies, and Other Strangers*. San Francisco: Jossey-Bass.
- Payne, R. L. (2001). A Three Dimensional Framework for Analyzing and Assessing Culture/Climate and its Relevance to Cultural Change. In Cooper, C. L., Cartwright, S., & Earley, P. C. (Eds.), *The International Handbook of Organizational Culture and Climate* (pp. 105–122). West Sussex: John Wiley & Sons.
- Payne, B. (2003). Blog for business: Is it right for your company? *Marketingprofs.com*, 14 October. Retrieved July 8, 2009, from <https://www.marketingprofs.com/3/payne2.asp>
- Pedhazur, E. J. (1982). *Multiple Regression in Behavioral Research*. New York: CBS College Publishing.
- Peirce, C. S. (1878). How to make our ideas clear. *Popular Science Monthly*, 12, 286-302. Reprinted in P. Wiener (Ed.) (1958), *Selected Writings* (pp. 114-136). New York: Dover Publications.
- Peña-López, I. (2009). Digital Competences (VI). Joan Torrent: Electronic skill-biased technological change (e-SBTC), enterprise and work. In *ICTlogy*, #70, July 2009. Barcelona: ICTlogy. Retrieved October 15, 2009, website from <http://ictlogy.net/review/?p=2538>
- Pentland, A. (2008). Understanding ‘honest signals’ in business. *MIT Sloan Management Review*, 50(1), 70–75.
- Perry, W. G. (1970/1988). *Forms of ethical and intellectual development in the college years*. San Francisco, CA: Jossey-Bass.
- Pert, C. B. (1997). *Molecules of emotion: A science behind mind-body medicine*. New York: Touchstone.

Compilation of References

- Pettigrew, A. M. (1979). On studying organizational cultures. *Administrative Science Quarterly*, 24, 570–581. doi:10.2307/2392363
- Phillips, L. W., & Bagozzi, R. P. (1986). On Measuring Organizational Properties of Distributional Channels: Methodology Issues in the Use of Key Informants. *Research in Marketing*, 8, 313–369.
- Phillips, D. C. (1995). The good, the bad, the ugly: The many faces of constructivism. *Educational Researcher*, 24(7), 5–12.
- Pickering, J. M., & King, J. L. (1995). Hardwiring weak ties: Interorganizational computer-mediated communication, occupational communities, and organizational change. *Organization Science*, 6(4), 479–486. doi:10.1287/orsc.6.4.479
- Pingdom. (2008). Social network downtime in 2008 (www.pingdom.com). Sweden: Pingdom.
- Plessis, M. D. (2006). *The Impact of Organizational Culture on Knowledge Management*. Chandos Publishing.
- Popper, K. R. (1959). *The Logic of Scientific Discovery*. New York: Basic Books.
- Popper, K. (1950). *The open society and its enemies*. Princeton, NJ: Princeton University Press.
- Popper, K. (1972). *Objective knowledge*. Oxford: Oxford University Press.
- Porter, M. E., Takeuchi, H., & Sakakibara, M. (2000). *Can Japan compete?* Cambridge, Massachusetts: Perseus Publishing.
- Prawat, R. S. (1996). Constructivisms, modern and post-modern. *Educational Psychologist*, 31(3/4), 215–225. doi:10.1207/s15326985ep3103&4_6
- Probst, G., Buchel, B., & Taub, S. (1998). Knowledge as a Strategic Resource. In Krogh, G. V., Roos, & Kleine, D. (Eds). *Knowing in Firms: Understanding, Managing, and Measuring Knowledge* (pp. 240-252). London: Sage Publications.
- Rand, M. (2004). What is a wiki, how can they be used? Retrieved from <http://forbes.com/best/2004/1213/bow001.html>
- Rasa, S., & Budlong, S. (Producer/Director). (1997). *Where Words Prevail*. [Web]. Retrieved from <http://www.wherewordsprevail.com>
- Ratey, J. J. (2001). *A user's guide to the brain: Perceptions, attention, and the four theaters of the brain*. New York: Pantheon Books.
- Ravasi, D., & Schultz, M. (2006). Responding to organizational identity threats: Exploring the role of organizational culture. *Academy of Management Journal*, 49(3), 433–458.
- Rayward, W. B. (1975). *The Universe of Information: The Work of Paul Otlet for Documentation and International Organisation*. Chicago, IL: University of Chicago.
- Redmond, M. V., & Bunyi, J. (1993). The Relationship of Intercultural Communication Competence with Stress and the Handling of Stress as Reported by International Students. *International Journal of Intercultural Relations*, 17(2), 235–254. doi:10.1016/0147-1767(93)90027-6
- Reed, R., Lemak, D. J., & Montgomery, J. C. (1996). Beyond Process: TQM Content and Firm Performance. *Academy of Management Review*, 21(1), 173–202. doi:10.2307/258633
- Reed, N. (2009, September 30). Gigatweet. Retrieved from [popacular.com: http://popacular.com/gigatweet/](http://popacular.com/gigatweet/)
- Richardson, G. P. (1991). *Feedback thought in social science and system theory*. Philadelphia, PA: University of Pennsylvania Press.
- Richardson, V. (2003). Constructivist pedagogy. *Teachers College Record*, 105(9), 1623–1640. doi:10.1046/j.1467-9620.2003.00303.x
- Riggins, F. G., & Rhee, H. (1999). Developing the Learning Network Using Extranets. *International Journal of Electronic Commerce*, 4(1), 65–83.

- Rikowski, R. (2007). Knowledge Management Within and Across Cultures and Cultural Theories. In Rikowski, R. (Ed.), *Knowledge Management: Social, Cultural and Theoretical Perspectives* (pp. 135–148). Oxford: Chandos Publishing.
- Robbins, S. P., & Judge, T. A. (2010). *Essentials of organizational behavior*. Upper Saddle River, NJ: Prentice Hall.
- Roberts, J. (2000). From Know-how to Show-how?: Questioning the Role of Information and Communication Technologies in Knowledge Transfer. *Technology Analysis and Strategic Management*, 12(4), 429–443. doi:10.1080/713698499
- Robins, K., & Webster, F. (1999). *Times of the Techno-culture: From the information society to the virtual life*. London: Routledge.
- Roman-Velazquez, J. (2005). An empirical study of organizational culture types and their relationship with the success of a knowledge management system and the flow of knowledge in the U.S. government and nonprofit sectors. In Stankosky, M. (Ed.), *Creating the discipline of knowledge management*. Oxford: Elsevier Butterworth-Heinemann. doi:10.1016/B978-0-7506-7878-0.50008-9
- Rose, S. (2005). *The future of the brain: The promise and perils of tomorrow's neuroscience*. New York: Oxford University Press.
- Ross, P. E. (2006). The expert mind. *Scientific American*, (August): 64–71. doi:10.1038/scientificamerican0806-64
- Rousseau, D. M. (1997). Organizational behavior in the new organizational era. *Annual Review of Psychology*, 48, 515–546. doi:10.1146/annurev.psych.48.1.515
- Ruggles, R. (1998). The state of the notion: Knowledge management in practice. *California Management Review*, 40(3), 80–89.
- Russell, P. (1982). *The awakening earth: The global brain*. London: Routledge & Kegan Paul.
- Ryle, G. (1949). *The concept of mind*. London: Hutchinson.
- Sackman, S. A. (1991). *Cultural Knowledge in Organizations: Exploring the Collective Mind*. Newbury Park, CA: Sage Publications.
- Saenz, J., Aramburu, N., & Rivera, O. (2007). Innovation focus and middle-up-down management model: Empirical evidence. *Management Research News*, 30(11), 785–802. doi:10.1108/01409170710832232
- Sanchez (2004). Retrieved April 5, 2009 from <http://www.knowledgeboard.com/download/3512/Tacit-vs-Explicit.pdf>
- Schein, E. H. (1984). Coming to a new awareness of organizational culture. *Sloan Management Review*, 25, 3–16.
- Schein, E. H. (1993). On dialogue, culture, and organizational learning. *Organizational Dynamics*, 22(2), 40–51. doi:10.1016/0090-2616(93)90052-3
- Schein, E.H. (1986, January). What you need to know about organizational culture. *Training and Development Journal*.
- scherrtech. (2009, May 16). Internet, Mobile, Broadband & Social Media World Usage Statistics 2009. Retrieved from scherrtech: <http://www.scherrtech.com/wordpress/2009/05/16/internet-mobile-broadband-social-media-usage-statistics-2009/>
- Schore, A. N. (1994). *Affect regulation and the origin of the self: The neurobiology of emotional development*. Hillsdale, NJ: Erlbaum.
- Schore, A. N. (2002). Dysregulation of the right brain: A fundamental mechanism of traumatic attachment and the psychopathogenesis of posttraumatic stress disorder. *The Australian and New Zealand Journal of Psychiatry*, 36, 9–30. doi:10.1046/j.1440-1614.2002.00996.x
- Schutz, A., & Luckmann, T. (1983). *The structures of the life-world (Vol. 2)*. London: Heinemann.
- Senge, P. (1990). *The fifth discipline. The art and practice of the learning organization*. London: Random House.
- Senge, P., Kleiner, A., Roberts, C., & Ross, G. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. New York: Doubleday.

Compilation of References

- Serpa, R. (1985). Creating a candid corporate culture. *Journal of Business Ethics*, 4(5), 425–430. doi:10.1007/BF02388598
- Serrano, V., & Fischer, T. (2007). Collaborative innovation in ubiquitous systems. *Journal of Intelligent Manufacturing*, 18, 599–615. doi:10.1007/s10845-007-0064-2
- Shrivastava, P., & Schneider, S. (1984). Organizational frames of references. *Human Relations*, 37(10), 795–809. doi:10.1177/001872678403701002
- Siakas, K., & Gergiadou, E. (2008). Knowledge sharing in virtual and networked organizations in different organizational and national cultures. In Bolisani, E. (Ed.), *Building the knowledge society on the Internet: Sharing and exchanging knowledge in networked environments* (pp. 45–64). Hershey, PA: Information Science Reference.
- Siegel, D. J. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being*. New York: W. W. Norton & Company.
- Sirkkunen, K. L. (2008). *Social media - Introduction to the tools and processes of participatory economy*. Finland: Tampere University Press.
- Skoyles, J. R., & Sagan, D. (2002). *Up from dragons: The evolution of human intelligence*. New York: McGraw-Hill.
- Smythe, J. (2007). *The CEO: Chief Engagement Officer* (pp. 83–84). United Kingdom: Grower.
- Snowden, D. (2002). Complex acts of knowing: Paradox and descriptive self awareness. *Journal of Knowledge Management*, 6(2), 100–111. doi:10.1108/13673270210424639
- Snowden, D. (2003). The knowledge you need, right when you need it. *Knowledge Management Review*, 5(6), 24–27.
- Solis, B. (2007). The definition of social media. Web-Pro News. Retrieved Oct. 1, 2009 from <http://www.webpronews.com/blogtalk/2007/06/29/the-definition-of-social-media>
- Sousa, D. A. (2006). *How the brain learns*. Thousand Oaks, CA: Corwin Press.
- Spanierman v. Hughes, No. 06-1196 (D. Conn. Sept. 16, 2008)
- Spencer, H. (1929). *Education: Intellectual, moral, and physical*. London: Watts.
- Spender, J.-C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17(62), 45–62.
- Spender, J. C. (1996). Organizational knowledge, learning and memory: Three concepts in search of a theory. *Journal of Organizational Change*, 9(1), 63–78. doi:10.1108/09534819610156813
- Sproull, L., & Kiesler, S. (1991). *Connections: New ways of working in the networked organization*. Cambridge, MA: MIT Press.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Stanton, J. (2009). The New Media and the US Military. Retrieved April 1, 2010 from http://www.digitalcommunitiesblogs.com/web_20_convergence/2009/05/the-new-media-and-the-us-milit.php
- Statistics Bureau Japan. (2008). *Japan statistical year-book*. Retrieved October 29, 2008 from <http://www.stat.go.jp/data/nenkan/zuhyou/y1113000.xls>
- Stern, D. N. (2004). *The present moment in psychotherapy and everyday life*. New York: Norton.
- Stewart, T. (1997). *Intellectual Capital - The New Wealth of Organizations*. New York: Broadway Business The Economist Intelligence Unit. (2003). *Innovation: Remote Working in the Net-Centric Company*. (Executive Briefing)
- Stonier, T. (1990). *Information and the internal structure of the universe: An introduction into information physics*. New York: Springer-Verlag.
- Stonier, T. (1997). *Information and meaning: An evolutionary perspective*. New York: Springer.

- Stoyko, P. (2009). Organizational culture and the management of organizational memory. In Girard, J. (Ed.), *Building organizational memories: Will you know what you know?* (pp. 1–17). Hershey, PA: Information Science Publishing.
- Sullivan, A. (2005). The blogging revolution: weblogs are to words what Napster was to music. *Wired 10, May 2002*. Retrieved July 12, 2009, from <http://www.wired.com/wired/archive/10.05/mustread.html?pg=2>
- Surowiecki, J. (2004). *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies, and nations*. New York: Doubleday.
- Sveiby, K. E. (1997). *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*. Berrett-Koehler Publishers Inc.
- Sveiby, K. E. (2001). A Knowledge-based Theory of the Firm To Guide Strategy Formulation. *Journal of Intellectual Capital*, 2(4), 344–358. doi:10.1108/14691930110409651
- Szmatka, J., Lovaglia, M., & Wysienska, K. (2002). *The growth of social knowledge: Theory, simulation, and empirical research in group processes*. New York: Praeger Publishers.
- Szulanski, G. (1996). Exploring Internal Stickiness: Impediments to the Transfer of Best Practice within the Firm. *Strategic Management Journal*, 17(10), 27–43.
- Tacchi, J., Slater, D., & Hearn, G. (2003). *Ethnographic Action Research: A Handbook*. New Delhi: UNESCO.
- Takeuchi, H., & Nonaka, I. (2000). Reflection on knowledge management from Japan. In Morey, D., Maybury, M., & Thuraisingham, B. (Eds.), *Knowledge management: Classic and contemporary works* (pp. 183–186). Cambridge, Massachusetts: The MIT Press.
- Takeuchi, H. (2001). Towards a universal management concept of knowledge. In Nonaka, I. (Ed.), *Managing industrial knowledge: Creation, transfer and utilization* (pp. 315–329). London: SAGE Publications.
- Tallis, F. (2002). *Hidden minds: A history of the unconscious*. New York: Arcade.
- Tapscott, D., & Williams, A. D. (2006). *Wikinomics: How mass collaboration changes everything*. London: Portfolio Hardcover.
- Tavani, H. T. (2004). *Ethics and technology: Ethical issues in an age of information and communication technology*. Hoboken, NJ: John Wiley & Sons.
- Tokuoka, K. (2007). Kojin kiten no komyunikeeshon ga inobeeshon o hagukumu o jōsei (Communication that originates in the individual fosters the creation of a soil for innovation). *Jinzai kyōiku (Human Resources Development)*, 19(12), 24–35.
- Tovar, T. (2008, March). How MySpace Is Hurting Your Network. Retrieved from pcsympathy: <http://www.pcsympathy.com/2008/03/08/how-myspace-is-hurting-your-network/>
- Triandis, H. (1995). *Individualism & Collectivism*. Boulder, CO: Westview Press.
- Triandis, H., & Gelfand, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74, 118–128. doi:10.1037/0022-3514.74.1.118
- Tsai, S. F. (2005). Composite Diversity, Social Capital, and Group Knowledge Sharing: A Case Narration. *Knowledge Management Research and Practice*, 3, 218–228. doi:10.1057/palgrave.kmrp.8500075
- Tschannen-Moran, M., & Hoy, W. K. (2000). A multidisciplinary analysis of the nature, meaning, and measurement of trust. *Review of Educational Research*, 70, 547–593.
- Tsoukas, H. (2005). *Complex Knowledge: Studies in Organizational Epistemology*. New York: Oxford University Press.
- Tsoukas, H., & Vladimirou, E. (2005). What Is Organizational Knowledge. In Little, S., & Ray, T. (Eds.), *Managing Knowledge: An Essential Reader* (2nd ed.). London: Sage Publications.

Compilation of References

- Tucker, E., Kao, T., & Verma, N. (2005). *Next-Generation Talent Management - Insights on How Workforce Trends Are Changing the Face of Talent Management* (p. 1). Hewitt Associates.
- Turiel, E. (1983). *The Development of Social Knowledge: Morality & Convention*. Cambridge, UK: Cambridge University Press.
- US DOT, Aviation Consumer Protection Division. (1998-2009). Air Travel Consumer Report. Retrieved from <http://airconsumer.dot.gov/reports/index.htm>
- USAF. (2003). *The U.S. Air Force Transformation Flight Plan*. Retrieved from http://www.af.mil/library/posture/AF_TRANS_FLIGHT_PLAN-2003.pdf.
- Van Wijk, R., Van Den Bosch, F. A. J., & Volberda, H. W. (2003). Knowledge and networks. In Easterby-Smith, M., & Lyles, M. A. (Eds.), *Handbook of organizational learning and knowledge management* (pp. 428–453). Malden, MA: Blackwell Publishing Ltd.
- Vashista, J. (2009, September 30). Retrieved 9 30, 2009, from www.injoos.com.
- Venkatraman, N. (1989). The Concept of Fit in Strategy Research: Toward Verbal and Statistical Correspondence. *Academy of Management Review*, 14(3), 423–444. doi:10.2307/258177
- von Krogh, G., Ichigo, K., & Nonaka, I. (2000). *Enabling Knowledge Creation. How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*. New York: Oxford University Press.
- Vygotsky, L. S. (1978). *Mind and society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Walsh, J. A., & Ungson, G. A. (1991). Organizational memory. *Academy of Management Review*, 16(1), 57–91. doi:10.2307/258607
- Wang, P. J., & Schulte, W. D. (2005). The state of knowledge management practice in Taiwan. In Stankosky, M. (Ed.), *Creating the discipline of knowledge management: The latest in university research*. Oxford: Elsevier Butterworth-Heinemann. doi:10.1016/B978-0-7506-7878-0.50010-7
- Ward, J. (2006). *The student's guide to cognitive neuroscience*. New York: Psychology Press.
- Wasko, M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *Management Information Systems Quarterly*, 29(1), 35–57.
- Weaver, H. F. (2009). Defense Department Officials to Announce Balanced Social Media Policy, American Forces Press Service. Retrieved April 1, 2010 from <http://www.af.mil/news/story.asp?storyID=123169299>
- Weil, D. (2004). Three reasons to publish an e-newsletter AND a blog. *Marketingprofs.com*, 13 April. Retrieved July 12, 2009, from <http://www.marketingprofs.com/4/weil11.asp>
- Wellman, B., Salaff, J., Dimitrova, D., Garton, L., Gulia, M., & Haythornthwaite, C. (1996). Computer networks as social networks: Collaborative work, telework, and virtual community. *Annual Review of Sociology*, 22, 213–238. doi:10.1146/annurev.soc.22.1.213
- Welsh, M. A., & Dehler, G. (2004). P(l)aying attention: Communities of practice and organized reflection. In Reynolds, M., & Vince, R. (Eds.), *Organizing Reflection*. Aldershot, UK: Ashgate.
- Wenger, E. (1998). *Communities of Practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Wenger, E. (1999). Learning as Social Participation. *Knowledge Management Review*, 1(6), 30–33.
- Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review*, 78(1), 139–145.

- Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal Online*, 1.
- Whelan, R. (2009, May 5). Fifty years on, CP Snow's 'Two Cultures' are united in desperation. Retrieved March 2010, from Telegraph.co.uk: <http://www.telegraph.co.uk/technology/5273453/Fifty-years-on-CP-Snows-Two-Cultures-are-united-in-desperation.html>
- Whyte, G. (1989). Groupthink reconsidered. *Academy of Management Review*, 14(1), 40–56. doi:10.2307/258190
- Wickramasinghe, N., & Von Lubitz, D. (2007). *Knowledge-based enterprise: Theories and fundamentals*. Hershey, PA: Idea Group Publishing.
- Wiig, K. (2004). *People-Focused Knowledge Management: How Effective Decision Making Leads to Corporate Success*. Burlington: Elsevier Butterworth-Heinemann.
- Wikipedia (2009). Bernard Madoff Encyclopedia Entry. Retrieved from URL http://en.wikipedia.org/wiki/Bernard_Madoff
- Wikipedia (n.d.). *Wiki*. Retrieved from <http://en.wikipedia.org/wiki/Wiki>
- Wikipedia. (2009, September 27). Wikipedia: About. Retrieved from Wikipedia: <http://en.wikipedia.org/wiki/Wikipedia:About>
- Wikipedia. (2010, March). Isaac Asimov. Retrieved March 2010, from Wikipedia: http://en.wikipedia.org/wiki/Isaac_Asimov
- Wikipedia. (2010, March). Six degrees of separation. Retrieved March 2010, from Wikipedia: http://en.wikipedia.org/wiki/Six_degrees_of_separation
- Williams, R., & Edge, D. (1996). The social shaping of technology. *Research Policy*, 25, 856–899. doi:10.1016/0048-7333(96)00885-2
- Willis, P. (2001). The 'thing themselves' in phenomenology. *Indo-Pacific Journal of Phenomenology*, 1(1), 1–14.
- Windschitl, M. (2002). Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research*, 72(2), 131–175. doi:10.3102/00346543072002131
- Wolf, I. (2009, March 23). Cloud Computing and Social Networks Merge into "The Service Cloud"...03.23.09. Retrieved from lonewolflibrarian: <http://lonewolflibrarian.wordpress.com/2009/03/23/cloud-computing-and-social-networks-merge-into-the-service-cloud032309/>
- Wright, S. (1934). The method of path coefficients. *Annals of Mathematical Statistics*, 5, 161–215. doi:10.1214/aoms/1177732676
- Wright, S. (1971). Path Coefficients and Path Regressions: Alternative or Complementary Concepts? In Blalock, H. M. (Ed.), *Causal Models in the Social Sciences* (pp. 101–114). Chicago: Aldine Publishing Co.
- Wyld, D. C. (2008). Management 2.0: A primer on blogging for executives. *Management Research News*, 31(6), 448–483. doi:10.1108/01409170810876044
- Yu, T., & Cannella, A. A. (2007). Rivalry between Multinational Enterprises: An Event History Approach. *Academy of Management Journal*, 50(3), 665–686.
- Zack, M. H. (1999). Managing codified knowledge. *Sloan Management Review*, 40(4), 45–58.
- Zander, U., & Kogut, B. (1995). Knowledge and the speed of transfer and imitation of organizational capabilities: an empirical test. *Organization Science*, 6, 76–82. doi:10.1287/orsc.6.1.76
- Zemliansky, P., & St Amant, K. (2008). *Handbook of research on virtual workplaces and the new nature of business practices*. Hershey, PA: Information Science Reference.
- Zucker, L. (1986). Production of Trust: Institutional Sources of Economic Structure 1840-1920. In B.M. Staw & L.L. Cummings, (Ed.), *Research in Organizational Behavior*, 8, 53-111.

Compilation of References

Zull, J. E. (2002). *The art of changing the brain: Enriching the practice of teaching by exploring the biology of learning*. Sterling, VA: Stylus. ¹ See Bennet and Bennet (2009)

for a discussion of Self in a CUCA environment, that is, increasing Change, Uncertainty, Complexity, and Anxiety.

About the Contributors

John P. Girard is Professor of Management at Minot State University where he is actively engaged in academic research. He has written more than thirty articles and chapters for peer-reviewed or trade journals and books. John's first book was an edited volume entitled *Building Organizational Memories: Will you know what you knew?* published by IGI Global in 2009. He is the coauthor of *A Leader's Guide to Knowledge Management: Drawing on the past to Enhance Future Performance*, published by Business Expert Press in 2009. John speaks regularly on the subjects of knowledge management, transformation and innovation at events such as KM World, APQC's Knowledge Management Conference, the World Congress on Intellectual Capital, KM Australia, KM Asia, and InfoVision (India). John has undertaken training and consulting assignments for clients such as the Canadian International Development Agency, U.S. Department of Labor, Ark Group Australia, Success Steps Saudi Arabia, Saline Water Conversion Corporation, High Commission for the Development of ArRiyadh and the Dubai Municipality.

JoAnn L. Girard is the cofounder and managing partner of Sagology, a firm that focuses on connecting people with people to collaborate and share knowledge. She has worked on a variety of knowledge intensive research projects that considered issues such as information anxiety, enterprise dementia, and organizational memories. JoAnn is the coauthor of *A Leader's Guide to Knowledge Management: Drawing on the past to Enhance Future Performance*, published by Business Expert Press in 2009. She was a member of the Editorial Advisory Board for *Building organizational memories: Will you know what you knew?* published by IGI Global in 2009. Prior to forming Sagology, JoAnn was cofounder of two successful technology companies. JoAnn dedicates most of her spare time to animals. She is a board member of her local zoological society and volunteers as an interpretive speaker at the zoo.

* * *

Alex Bennet is co-founder of the Mountain Quest Institute (www.mountainquestinstitute.com), a research and retreat center nestled in the Allegheny Mountains of West Virginia focused on achieving growth and understanding through quests for knowledge, consciousness, and meaning. Dr. Bennet has degrees in Human and Organizational Systems, Management for Organizational Effectiveness, Human Development, and English Literature and Marketing. Alex served as the Chief Knowledge Officer for the U.S. Department of the Navy (DON), and was co-chair of the Federal KM Working Group. Alex and her husband David Bennet write and publish extensively. They are co-authors of the seminal work, *Organizational Survival in the New World: The Intelligent Complex Adaptive System* (Elsevier, 2004),

About the Contributors

a new theory of the firm based on research in complexity and neuroscience and incorporating networking theory and knowledge management. More recently they worked with the government of Canada to co-author and publish *Knowledge Mobilization in the Social Sciences and Humanities: Moving from Research to Action* (MQIPress, 2007).

David Bennet is co-founder of the Mountain Quest Institute. David's experience spans many years of service in the Military, Civil Service and Private Industry, including fundamental research in underwater acoustics and nuclear physics and frequent design and facilitation of organizational interventions. Most recently, he was CEO, then Chairman of the Board and Chief Knowledge Officer of a professional services firm. Dr. Bennet has degrees in Physics, Mathematics, Nuclear Physics, Human and Organizational Systems, Human Development, and Liberal Arts. The Bennets continue research specifically focused on knowledge and learning. They take a Consilience approach, integrating the latest findings and thought from neuroscience, complexity theory, human and organizational development, and values. MQI is scientific, humanistic and spiritual and finds no contradiction in this combination.

Nicholas N. Bowersox is a doctoral student at TUI University, where he is currently pursuing a PhD in Business Administration. He holds a Master of Science in Management from Minot State University and an MBA from Upper Iowa University. His current research interests focus on contemporary knowledge management theories. Currently, Nick works for the Department of Defense, United States Air Force, Wright Patterson Air Force Base, OH. In his spare time, Nick enjoys serving the role of adjunct professor at several local universities teaching business, management, and statistics classes. In addition, he is an active member of many professional organizations such as the Knowledge Management Professional Society, Academy of Management, and Adult Higher Education Association.

Kimiz Dalkir is currently an Associate Professor in the McGill School of Information Studies, where she developed and now coordinates the Knowledge Management stream. Her book, *Knowledge Management in Theory and Practice*, published in 2005 by Butterworth-Heinemann/Elsevier, has been widely adopted by both the academic and practitioner communities. In 2006, Dr. Dalkir received the Faculty of Education Excellence in Teaching Prize. Her most recent grant, from SSHRC, is to investigate how knowledge management can be applied to universities. Prior to joining McGill University, Dr. Dalkir was Director of Global KM Services at DMR Consulting where she was actively involved in the transfer of knowledge management (KM) and electronic performance support systems (EPSS) to clients in Europe, Japan and North America.

Loretta L. Donovan is a cutting edge, versatile contributor to organizational development and corporate learning. She is the Corporate Director of Organizational Learning and Leadership at Health Quest System in the Mid-Hudson region of New York, founder of the Worksmarts Group, and an Associate with Innovation Partners International. Her perspective, based on a wealth of experience as an executive and consultant, is focused on dialogue, knowledge creation and critical action. She is an early adopter of Web 2.0 and fosters the use of open source and social media for digital collaboration. Among the places where she has helped with successful transformation of vision and viewpoints, new organizational structures, and redesign of business processes are technology companies, professional sports teams, healthcare institutions and universities.

Cindy M. Gordon is a seasoned senior executive with over twenty years of industry experience in communications & high tech and financial services. Cindy is currently the Founder and CEO of Helix Commerce International Inc, (www.helixcommerce.com) a company specializing in business innovation and growth acceleration strategies that leverages disruptive innovation and next generation internet business approaches. Dr. Gordon is also the Founder of Helix Virtual Worlds (www.helixvirtualworlds.com), a company specializing in Virtual World MetaVerses. Prior to founding Helix, Dr. Gordon held senior positions with: XDL Invest, Accenture, Xerox and Citicorp. She is also the Founder and Past Chair of the CEO Fusion Center helping early stage technology CEO's mentor each other for growth sustainability. She is also currently a Director for CATA for the National Board and is the National Chair of the CATA Women in Technology Forum (WIT) the Canadian organization. She is actively involved in CATA's Innovation as a Nation Platform initiatives.

Parissa Haghirian is an Associate Professor of International Management at Sophia University in Tokyo, Japan. She is further a visiting professor at Groupe HEC in Paris, Helsinki School of Economics, Keio Business School and an adjunct professor at Temple University in Tokyo. She obtained her Master's in Japanese Studies from Vienna University (1998) and was awarded a Master's Degree (2000) and PhD in International Management (2003) by Vienna University of Economics and Business Administration. After her dissertation, she joined the Department of International Management at Kyushu Sangyo University in Fukuoka until March 2006, when she joined Sophia University. Parissa's research and consulting interests include Japanese management, market entries of Western firms into the Japanese market, and Japanese consumer behavior.

Benjamin Hentschel is a Master student at the Graduate School of Global Studies (majoring in International Business and Development Studies) of Sophia University in Tokyo. After a semester abroad in Japan at Ryukoku University in Kyoto (2006) and several internships related to German-Japanese business relations in Tokyo (2006/07) and Düsseldorf (2007/08), he returned to Tokyo in 2008 to do extensive research for his diploma thesis. In 2009, he obtained a Diploma degree in East Asian Regional Studies from Duisburg-Essen University, Germany. His research interests include knowledge management, the contemporary Japanese firm and economy, intercultural communication and management.

Chethan.M is a technical evangelist. He is working as Information Analyst at Triumph India Software Services. He has done his M.Tech in Information Systems and holds a Bachelor degree in Mechanical Engineering. He is passionate about Knowledge Management especially development and customization of KM Tools. He has Co-authored and presented research papers on KM Frameworks at ICKMIC 2009 and on Information Industry Cluster Bangalore at CWKM 2010. He has more than 3 years of diverse experience in various domains. Other than brief stints in domain related jobs, he has also been into sales/marketing, Process Orientation with domain expertise in US/India Insurance. Always challenging, be it on the job or target oriented sales, Insurance Certifications, He has been able to find a niche balance and performed well both in academics and extracurricular activities.

Scott C. Mackintosh is the Managing Partner at Glengarry Group Consulting where he is focused on the firm's mission of redefining business leadership. By introducing military principles to the corporate experience he draws a unique focus on leadership. He is a recognized thought leader in the field of leadership development. As a serving member of Canada's Armed Forces Scott received basic Officer

About the Contributors

training at 32 Combat Brigade Group Battle School. He has attended the Infantry School at the Combat Training Centre in Gagetown NB where he received advanced leadership training. He has held leadership positions in both Armoured and Infantry Regiments. He continues to lead soldiers today as an Officer in Canada's oldest Reserve Regiment – The Queen's Own Rifles of Canada.

Stefania Mariano is the Head of Campuswide Research, the School of Management Research Coordinator and an Assistant Professor of Management at NYIT, New York Institute of Technology. She received her PhD in Management and her MBA with honours from Molise University, Italy. She was a visiting scholar at the Department of Management Science of the George Washington University (USA) and a visiting researcher at IKI – Institute of Knowledge and Innovation at GWU (USA). She has participated in national and international research projects in the USA, Europe, and the Middle East. She has presented several research papers at national and international conferences, has published in numerous academic journals, and has contributed chapters for several books. She has experience teaching in both the undergraduate and graduate levels.

Paul McBride is a Manager of Quality for DairiConcepts, LP located in Springfield, Missouri. He holds an undergraduate degree in Biology and a Master of Business Administration, both from Lindenwood University in Saint Charles, Missouri. He also holds a Master of Life Science with a concentration in Biology from the University of Maryland in College Park, Maryland. Paul is a doctoral student at TUI University and currently pursuing a PhD in Business Administration. His research interests include Knowledge Management, Organizational Culture, and Transformational Leadership. Outside of work and school he enjoys spending time with his wife Jessica, his daughter Madison, and his son Thomas.

Andrew Miller consults with community organizations and social entrepreneurs to build online and offline outreach. Using social media tools that complement traditional community building methods he helps organizations embrace change and drive innovation. As a public speaker Andrew is frequently asked to offer insight on social media applications and new technology implementation to a diverse set of audiences; from government to non-profits, engineers to artists, students to professionals. Andrew is a regular on-air and online contributor to WOSU Public Media, Columbus Dispatch family of newspapers and several online publications.

Nhu T. B. Nguyen is currently a JSPS postdoctoral fellow at Graduate School of Knowledge Science, Japan Advanced Institute of Science and Technology (JAIST), Japan. She received bachelor degree in international trade from Hanoi Foreign Trade University, Vietnam (2001), master degree in international trade law from University of Francois-Rabelais de Tours, France (2005), and doctoral degree in social knowledge science from Japan Advanced Institute of Science and Technology, Japan (2009). Her research interests include cross-cultural management, knowledge management, cross-cultural knowledge management, organizational culture perspectives including Fragmentation, Integration, and Differentiation perspective. She can be reached at nhu-ntb@jaist.ac.jp.

Haris Papoutsakis is an Associate Professor at the School of Applied Technology at the Technological Educational Institute of Crete, and the Honorary Treasurer of WOCATE, the World Council of Associations for Technology Education. He holds an Electrical Engineer degree (1971), an MBA (1974) and a recent PhD (2005). His area of research relates to innovation, entrepreneurship, quality and knowl-

edge management and focuses on the industrial inter-departmental relationships and the acquisition of work-related knowledge and skills in education and training. Prior to his assignment at the TEI of Crete in 1986, he worked for more than twelve years with Mobil Oil, Hewlett-Packard and IT&T in field and senior management positions in Greece and the Middle East.

Mohan Ramanathan is an entrepreneur, investor and is the co-founder director of Triumph India Software Services, Bangalore that specializes in Technical writing, Editorial Services and Information Management. He is an accomplished senior management executive with over 30 years of IT industry experience. His core competency spans strategic and operational planning, building offshore-onshore business, building effective teams of senior managers, overseeing regulatory compliances, budgeting, escalation management, large program management, special initiatives etc. His hobbies range from astronomy to music and cooking. He is a voracious reader and likes to listen to both Western and Carnatic classical music.

Salvatore Rasa claims that he usually does not fit in anywhere in particular. He has a B.A. in philosophy and a M.F.A in directing. Fortunately, he has been able to work in a variety of learning, organization design and strategic communication projects for global companies, the people who live on his block in New York City, and several of the world's wonderful arts institutions. Often, his work has involved teams experiencing radical change in over 120 countries and sometimes, it's been with a small group of dedicated professionals who understand that their own networks provide answers that should be shared. Providing, they can be heard. Sal is a founding member of im21 (*Innovation - Measurement – 21st Century*) which focuses on inclusive communication in a diverse global workplace. He is president of *generating community – driven solutions* dedicated to the notion that the ability of an organization or community to communicate is a direct reflection of the overall health of that entity.

Suzanne Roff-Wexler, PhD is a consulting psychologist focused on 21st technology and psychology, social media, narrative, and collective knowledge. She is co-founder and senior partner of Psychology21C -- a collaborative venture dedicated to applying new technologies to the science of human behavior. As president of Compass Point Consulting, she provides executive coaching and consulting to client organizations. Suzanne is an Adjunct Assistant Professor at New York University and Regional Director of the Gurteen Knowledge Community in New York City. She has a passion for bringing people together to have meaningful conversations, learn, collaborate, and make sense of personal and organizational life.

Fjodor Ruzic is doctor of information sciences at University of Zagreb where he is lecturer in new media, and interactive multimedia systems. He was working on both research and implementation sides of networked databases, educational material, and digital media as well as on information-communications systems development. He published over 130 scientific and research papers in international journals and he is author of several books dealing with graphical user interfaces, multimedia and Internet. His recent research activities are covering the integration of information content and information-communications systems. The research topics of the utmost interest to him cover the Technical, social and legal issues of information technology and its impact on society. In this field, he was the author of national laws on electronic documents and electronic signatures. He is also member of many national and international bodies relating to telecommunications systems integrity, information resources management and multimedia systems deployment.

About the Contributors

Katsuhiko Umemoto is a Professor in the Graduate School of Knowledge Science of Japan Advanced Institute of Science and Technology (JAIST), Japan. Katsuhiko Umemoto graduated from Kyushu University in 1975 with BA in Economics. He has worked as research associate for Ikujiro Nonaka at Hitotsubashi University and obtained his doctoral degree in public policy from George Washington University in 1997. His current research interests include knowledge management in non-business sectors such as public administration, health care, social welfare, NPOs, etc. He was a member of the project for the Knowledge-Creating Company that initiated the knowledge management movement and has translated the book into Japanese. He has also translated Davenport and Prusak's *Working Knowledge* and Nancy Dixon's *Common Knowledge*, worldwide bestsellers in the field of knowledge management. He can be reached at ume@jaist.ac.jp.

Jagdish Vasishtha is the Co-Founder and CEO of Injoos, a leading social collaboration platform for business. He has close to two decades of experience in Information Technology and Telecommunications. In 2007 he co-founded Injoos after having held a number of leadership positions with Infosys Technologies Limited. During his tenure at Infosys he successfully led large IT outsourcing and transformation projects for Fortune 100 companies like British Telecom and AT&T. He is an avid blogger and a regular speaker at industry events on topics ranging from social collaboration, software as a service, cloud computing, knowledge management and IT outsourcing. He received his bachelor's degree with honors in electronics and communications engineering from Mysore University, India.

Index

Symbols

20th century media culture 54

A

absorptive capacity 118, 128
 A current MIT Media Lab project 107
 adaptive oscillators 10
 Air Force Center of Excellence for Knowledge Management (AFKN) 185, 186
 American Telephone & Telegraph (AT&T) 45
 annotation 245, 247
 AOL 63
 artifact 128
 assets 25, 26, 35
 associative patterning 3, 5, 8, 16, 20
 asynchronous communication 59
 asynchronous social interaction 60

B

baby boomers 61
 bandwidth 237, 241, 246, 247
 bandwidth divide 241
 Bank of America 70
 Bank of Nova Scotia 66
 behavioral science 53
 Best Buy 104
 best friends forever (BFF) 42, 51
 best practices 166, 175
 big bang approach 61
 biological perspectives 1
 Biological systems 15
 BlackBerry 38, 39
 bloggers 64
 blogging 238

blogs 24, 32, 35, 46, 50, 62, 64, 65, 66, 67, 70, 71, 72, 73, 74, 77, 83, 85, 164, 166, 200, 202, 238, 240, 282
 bootlegging policy 100
 British Telecom 70
 B-SPAN 66, 67
 business goals 122

C

Canadian Broadcast Corporation (CBC) 130, 138
 career networks 240
 case studies 24, 26, 29, 32
 cellular phones 84
 Citibank 70
 closed loop learning 123
 cloud computing 237, 244
 co-evolve 19
 cognitive science 53, 287
 collaboration business models 63
 collaboration commerce (c-commerce) 63
 collaborative entanglement 1, 2, 15, 16
 collaborative process of socializing knowledge 61
 collaborative tagging 245
 collective intelligence 25, 33, 50, 58, 59, 63
 collective learning 183, 184
 collectivism 251, 267, 268, 289
 Columbus, Christopher 46, 47
 Commander of the British Empire (C.B.E.) 41
 commonsense 251
 CommSecure 70
 communication plans 45
 communications 196, 201, 202
 communication technologies 96

Index

communities of practice (CoPs) 55, 179, 180, 181, 182, 183, 184, 186, 187, 188, 191, 192
Community Circle 105, 110, 112
community content 240
competing values framework (CVF) 267
complex adaptive system 16, 20
complex epistemology 13
complex knowledge 19
computer-mediated electronic communications 261
computer technologies 179
conceptual knowledge 145
connections 24, 27, 32
constructivism 254, 259, 268, 269, 286, 287, 288, 289
content management system (CMS) 197, 205
context shapes content 11
copy left 108, 113
Creative Commons 101, 108, 113
cross-cultural competencies 145
cross-cultural environment 139, 140, 142, 151, 153, 154, 162
cross-cultural knowledge 139, 140, 143, 145, 151, 152, 153, 154, 155, 156, 157
cross-cultural knowledge management (CCKM) 139, 140, 151, 152, 154, 155, 157
cross-cultural management (CCM) 139, 140, 145, 148, 152, 155, 157
cross-cultural partnerships 147
crowdsource 113
crowdsourcing 63, 239, 244, 247
cultural barriers 96, 97, 98, 110
cultural change 140, 148, 149, 151, 153, 156
cultural differences 139, 140, 146, 147, 148, 149, 151, 152, 153, 156, 157, 162
cultural diversity 140, 147, 151, 156
cultural intelligence 140, 149, 151
cultural knowledge 139, 140, 143, 145, 146, 151, 152, 153, 154, 155, 156, 157
cultural synergy 140, 147, 151
culture as knowledge 139, 140, 142, 151, 157, 161, 162
cyberspaces 133, 135

D

Darwin, Charles 62
data warehouses 96
decision-making 15, 118
deep knowledge 4, 8, 12, 13, 16
Del.icio.us 132
Department of Defense (DOD) 131, 132, 137, 184
Digg 35, 132
digital collaboration 38, 49
digital content 50, 60, 249, 263
digital data 113
digital DNA 102, 113
digital fingerprint 102, 107
digital immigrants 107
digital natives 100, 106, 107, 111, 112
digital world 97, 100, 102, 103, 107, 280
double-loop learning 123, 128

E

eBay 63
e-commerce 28, 242
economic growth 78
electroencephalograph (EEG) 2
Electronic Frontier Foundation (EFF) 102
emic 273
emotional content 14
emotional support 13, 19
empirical knowing 251
enriched environments 9
entanglement 1, 2, 15, 16, 20
enterprise 2.0 63, 77
enterprise application integration (EAI) 204, 205
espoused theory 128
etic 273
expert knowledge networks 240
explicit knowledge 82, 93, 142, 143, 144, 154
external environment 1, 5
external stimuli 11, 12

F

Facebook 25, 27, 29, 35, 97, 99, 102, 103, 111, 129, 130, 131, 132, 133, 138
face-to-face 27, 28, 31

face-to-face communication 78, 89
 face-to-face meetings 105
 face-to-face open conversations 53
 face-to-face settings 105
 facial expressions 8, 9
 factions 128
 factual knowledge 145
 Family Health International 70
 fax machines 96
 feedback loops 10
 fiscal health 96
 Flickr 27, 35, 54, 67, 164, 239, 243
 flock mentality 237
 folksonomies 60
 formal knowledge 93
 freeconomy 113
 free culture 108, 111, 112, 113
 freeware 60
 friend of a friend (FOAF) 199, 200, 205, 206
 functional magnetic resonance imaging (fMRI)
 2
 FYIgblogs 64

G

Gangs 2.0 43, 60
 Gates, Bill 118, 125, 126
 General Motors (GM) 64, 28
 Gilder's Law 262
 Global Economic Reports 66
 Global Secure Systems (GSS) 241
 goal-directed action 10
 Google 97, 101, 102, 104, 109, 110, 111
 groupthink 120

H

harvesting 105, 112, 113, 114
 healthcare 38
 healthcare institutions 38
 Helix Commerce International Inc. 61, 62, 77
 hierarchical structure 52
 holding environment 1, 13, 14
 human capital 25, 26, 35
 human internal information environment 11
 human knowledge 143
 human web 247

I

IBM 62, 65, 67, 68
 iLink 137
 individualism 267, 268, 289
 Informal knowledge 93
 information access 239
 information and communication technologies
 (ICT) 83, 84, 179, 253, 260, 270, 275,
 276
 information-communications systems 249,
 255, 256, 258, 275, 283
 information ethics 264, 265
 Information relevancy 198
 information sharing theory 26
 information society 252, 255, 256, 257, 258,
 260, 261, 263, 264, 265, 270, 272, 273,
 274, 279, 280, 282, 283, 284, 288
 information systems 212, 252, 275, 291
 information technology (IT) 165, 166, 167,
 173, 175, 178, 194, 198, 203, 205, 207,
 208, 209, 210, 263, 264, 265, 269, 270,
 274, 275, 276, 277, 278, 279, 280, 281,
 283, 284, 290
 information transformation 260
 ING Direct 65
 innovation growth 61
 innovation networks 240
 Institute for Management Development (IMD)
 44
 intangible assets 78
 intangible goods 79
 integrated supply chain of Ttrust 43, 60
 intellectual capital 25, 26, 33, 34, 35, 194, 204
 International Business Machines Corporation
 (IBM) 45
 International Finance Corporation (IFC) 66
 International Institute for Management Devel-
 opment (IMD) 44
 internet technology 45
 interpersonal skills 52
 intersubjective space 1, 13, 15
 IT construct (ITC) 218
 IT functions 214, 215, 220, 229

Index

J

- Japanese firm (J-Firm) 79, 83, 85, 86, 88, 89, 90
- Japanese knowledge management 79, 80, 81, 86, 89, 90
- Japanese organization 78, 80, 82, 89, 90

K

- K'Netix 122
- knowledge acquirement 119
- knowledge assets 207
- knowledge-based economy 252
- knowledge creation 55, 81, 86, 119, 120, 165, 166, 167, 168, 171, 175, 176, 178, 208, 209, 212, 219
- knowledge creation theory 143
- knowledge economy 252, 256, 263, 285, 290
- Knowledge fragmentation 193, 194, 198, 199, 200
- knowledge generation 186
- Knowledge Management (KM) 24, 25, 32, 33, 34, 78, 79, 80, 81, 82, 84, 85, 86, 88, 89, 90, 91, 92, 93, 177, 180, 181, 183, 185, 186, 190, 191, 193, 198, 199, 201, 203, 207, 208, 209, 210, 212
- knowledge management researchers 24
- knowledge mobilization 15
- knowledge processes 166, 167, 173, 174
- knowledge sharing 4, 12, 13, 14, 26, 27, 29, 30, 32, 33, 119, 120, 122, 123, 124, 125, 165, 166, 168, 171, 172, 173, 178, 180, 184, 186, 190, 191
- knowledge society 180, 252, 255, 262, 263, 264, 265, 275, 282
- knowledge transfer 164, 166, 168, 171, 173, 178
- knowledge visualization 167, 169, 170

L

- laptops 84
- laugh out loud (LOL) 42
- law of two feet 62
- learning environments 179, 180
- learning networks 240
- level of trust 1

- lifestreams 35
- Linden Script Language (LSL) 245
- lost decade 78

M

- machine swareness 113
- management styles 97
- mashups 245
- mass communication 45, 283
- mental model 54, 81, 251
- message boards 35, 84, 86, 87, 88, 93
- Metadata 113
- Metcalfe's Law 262
- micro-blogger 65
- micro blogs 35, 62
- Microsoft 101, 111, 125
- military led initiatives 133
- military services 133
- Ministry of Internal Affairs and Communications (MIC) 83, 84, 91
- Ministry of Public Management, Home Affairs, Posts, and Telecommunications (MPHPT) 83, 84, 91
- mirror behavior 12
- mirror neurons 10
- mobile devices 88
- Molson Coors Brewing Company 71
- Moore's Law 262
- MTS Allstream 65, 70
- multi-disciplinary 46
- MySpace 35, 98, 99, 102, 131, 132

N

- National Coalition for Dialogue & Deliberation (NCDD) 45
- National Research Council 3, 22
- neural networks 13
- neuronal cells 5
- neuronal networking 13
- neuronal patterns 2, 5
- neuroscience 1, 2, 9, 13, 15, 19, 20, 21, 22, 23
- neuroscientific mechanisms 10
- Newsvine 132
- non-voiced communications patterns 11, 12
- noosphere 17

O

one-on-one meetings 120
 one-to-one communication mode 27
 online interaction 187, 188, 189
 online relationships 26
 online social capital 103
 ontology 141
 open source 109, 113, 198
 open source technology 60
 open space 105, 110, 112, 113
 operational security (OPSEC) 130, 131, 132, 137
 Oracle 65
 Order of the British Empire (O.B.E) 41
 organizational capital 25, 26
 organizational culture 115, 116, 117, 119, 121, 122, 123, 124, 125, 126, 250, 266, 267, 272, 288
 organizational habits 97
 organizational identity 121

P

pattern recognition 39, 53
 peace activists 96
 personal context 11, 12
 personal digital assistants (PDA) 84
 personal knowledge 164, 172, 173, 174
 personal reflection 15
 physical environment 10, 11, 19
 physical skills 52
 Pixar 70, 71
 podcasting 62, 64, 66, 67
 podcasts 35
 premotor cortex 10
 pretest-posttest model 32
 product lines 117, 124
 professional sports teams 38
 PSD Blog 66
 Psephology 247
 psychological operations (PSYOPS) 132, 133
 Public Broadcasting Service (PBS) 41
 pull technology 178
 push technology 178

R

radical transparency 113
 re-creating 16, 19
 Reddit 35
 resource description framework (RDF) 199, 200, 205
 Reuter News 66
 Royal Shakespeare Company (RSC) 41

S

sagas 128
 scalability 241, 242, 244
 schema theory 54
 scholarly ideas 37
 scientific knowledge 210, 211, 224, 225, 254
 SECI 143, 144, 153, 154, 155, 161, 162
 Second Life (SL) 35, 238, 239, 245
 self-awareness 13
 self-interest 26
 semi-independent systems 5
 semi-rigid models 122
 sensitive data 129, 130
 service oriented architecture (SOA) 245
 Shakespeare, William 41, 42, 43
 shallow knowledge 4
 shared knowledge 96, 207, 208, 209, 210, 211, 212, 213, 216, 217, 218, 219, 221, 224, 225, 226, 228, 229
 significant social relationships 12
 single-loop learning 123, 128
 Six Degrees of Separation 247
 Skandia model 26
 Skype 104
 social attunement 1
 social bonding 1, 9, 13, 19, 20
 social capital 25, 26, 33, 34, 35, 103, 192, 209, 253, 288
 social classification 245
 social collaboration tools 201
 social community 272
 social competition 201
 social computing technology 70
 social construction 54, 164, 259, 274, 283, 284
 social constructionism 54, 55
 social construction of technology (SCOT) 259

Index

- social creation 1, 8, 20
 - social creatures 1
 - social dimension 210, 211, 225
 - social environment 164
 - social forces 10
 - social indexing 245
 - social interaction 1, 2, 9, 13, 15, 19, 21, 183, 186
 - socialization, externalization, combination and internalization (SECI) 143
 - socialization process of knowledge 61
 - socialized learning 181
 - social knowledge 13, 17, 37, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 57, 78, 79, 85, 86, 89, 90, 130, 140, 143, 164, 165, 251, 252, 253, 254, 255, 256, 257, 258, 260, 262, 264, 267, 268, 269, 270, 272, 275, 277, 278, 279, 280, 281, 282, 283, 284, 286, 288, 289, 290
 - social knowledge convergence triangle 258, 284
 - social knowledge theory 164
 - social knowledge workspace 193, 194, 195, 199, 200, 201, 202, 203
 - social learning theory 180, 181
 - social media 24, 25, 26, 27, 28, 29, 32, 34, 35, 37, 38, 40, 45, 46, 49, 50, 52, 53, 54, 55, 57, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 136, 137, 164, 165, 166, 167, 170, 173, 174, 175, 200, 237, 239, 242, 246, 247, 256, 257, 270, 283, 290
 - social media adoption 96, 108
 - social media marketing 65
 - social media platforms 129, 132
 - social media technologies 64, 65, 74, 135, 200
 - social mediated conversation 63
 - social mediated technologies 62
 - social media tools 24, 29, 65, 71, 72, 73, 110, 200, 237, 239, 242
 - social media usability 242, 246
 - social media usage 97, 113
 - social network 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 253, 258, 261, 275, 283, 286
 - social network analysis 24, 26, 29, 31, 32, 33, 286
 - social network analysis (SNA) 24, 27, 32, 245
 - social network analytics technology 137
 - social networking 25, 29, 32, 35, 165, 166, 196, 197, 202
 - social networking services (SNS) 83, 85
 - social networking sites 25, 29, 239, 243
 - social networks 24, 26, 29, 32, 131, 132, 133
 - social organizations 25
 - social presence 27
 - social relations 209
 - social relationships 12, 19, 26, 28, 33
 - social search 237, 247
 - social search engine 247
 - social setting 15
 - social shaping of technology (SST) 259
 - social sites 239
 - social situation 10, 11, 12
 - social tagging 245
 - social theory of learning 181, 182
 - social value 35
 - social web 97
 - socio-technological shifts 106
 - Socrates 38
 - software as a service (SaaS) 245
 - structured knowledge 143
 - StumbleUpon 132
 - surface knowledge 3
 - synergy 140, 147, 151
- ## **T**
- tacit-explicit distinction 143
 - tacit knowledge 35, 82, 93, 142, 143, 144, 154, 184, 191, 224
 - targeted advertising 113
 - task force 45
 - taxonomy 39, 141, 258
 - taxonomy of trust 39
 - technoculture 257, 258, 260, 270, 271, 273, 275, 278, 284, 290
 - technoethics 257, 258, 262, 263, 264, 275, 278, 283, 290
 - technology assessment 264
 - technology-based communication 89
 - technology companies 38
 - telecommuting 196

the long tail 199
 Theory-in-Use 128
 The World Café (TWC) 46
 third culture 140, 146, 147, 151
 transcranial magnetic stimulation (TMS) 2
 turnover rate 26
 Twitter 24, 25, 32, 35, 100, 102, 103, 104, 129,
 131, 132, 138
 two cultures 247, 248

U

u-Japan 84
 usability 241, 242, 245, 246
 US Armed Services 131, 133
 user created content (UCC) 238
 user-created media content 54
 user-creations 60
 user generated content (UGC) 238

V

version management systems 197
 virtual communities of practice (VCoPs) 179,
 180, 181, 182, 184, 186, 187, 188, 189,
 190, 191
 virtual community 172
 virtual contact 184
 virtual social environment 164
 virtual social relationships 50
 virtual worlds 62, 64, 68
 vlogs 35
 voice of customer (VoC) 87, 88
 Volkswagen (VW) 41

W

war of attrition 115
 Web 1.0 paradigm 54
 Web 2.0 38, 39, 45, 46, 47, 49, 54, 55, 57, 60,
 62, 63, 64, 65, 67, 68, 69, 71, 72, 73, 74,
 76, 77, 83, 84, 90, 91, 93, 97, 164, 202,
 204
 Web 2.0-based channels 90
 Web 2.0 dolutions 64
 Web 2.x 260, 277
 Web 3.x 260, 277
 Web applications 50, 60, 245
 Web-based communities 60
 Web log 164, 165, 166, 167, 168, 169, 170,
 171, 172, 173, 174, 175, 178
 Web services 238, 245, 248
 Web technologies 46
 Western epistemology 79
 Wikipedia 35, 54, 58, 66, 77, 84, 107, 108,
 112, 164, 198, 199, 237, 239, 247
 wikis 24, 25, 35, 62, 64, 66, 70, 71
 Wired magazine 131
 work networks 240
 World Bank 66, 67, 209
 World Café 105, 110, 112, 114
 World of Warcraft 35
 World Wide Web 63, 17, 164, 198, 199

Y

Yahoo 63
 YouTube 54, 67, 164, 239, 241

Z

zone of proximal development (ZPD) 255