SECTION: THE MODELLING AND SIMULATION OF VIRTUAL ORGANIZATION

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A METAHISTORICAL INFORMATION THEORY OF SOCIAL CHANGE: THE THEORY

Abstract
A new yin-yang metahistorical approach that we call sociohistory is created to explore the possibilities of tracking and explaining social change. For this purpose, a frame of reference is created using Social Viable Systems theory to harness Sorokin's sociocultural dynamics. Epistemological content is enhanced by Frieden's new constructivist information theory called Extreme Physical Information. Its aim is to provide a scientific framework for the metahistory. The coupling of these theories has the potential for explaining and possibly predicting long-term, large-scale or short-term, small-scale sociocultural events. This new theory should be seen as emerging from the convergence of the approaches by Sorokin, Yolles and Frieden.

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A METAHISTORICAL INFORMATION THEORY OF SOCIAL CHANGE: AN APPLICATION

Abstract
In part 1 of this article a new metahistorical approach called sociohistory was created. Its aim is to explore the possibilities of tracking and explaining social change. Here, in part 2 of the article, EPI is placed in a form that enables it to be directly applied to subject societies. An example is an application to the sociohistory of postcolonial Iran, that some would say presages the rise of Islamic fundamentalism.

Keywords: Metahistory, Sociohistory, Social Change, Postcolonial Iran, Islamic Fundamentalism

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ROLE OF RESEARCH AND DEVELOPMENT ON THE 21ST CENTURY

Abstract
For the countries the importance of Research and Development has increased lately. In order to strengthened the economy of that given country more input are needed towards to these direction. Those countries that support researches could influence other sectors and finally, could achieve higher GDP, which is an important issue. So these questions stepped into spotlight to try to close up the gap between the different levels of development.
For the EU member countries and also the EU associate ones the opportunities much be known. The first part of this paper summarised the role of Research and Development in different countries by comparing the used amounts and their effect in the last decade in different sectors. The second part the possibilities of different EU supplies are in spotlight to help this process. A statistical analysis with SPSS is made to find the key factors to know what influence the amount of the R&D mostly and to calculate the results achieved with higher amounts. The results can help to focus on the important fields and to reach much higher economic growth.

Key words: Research, Development, changes, supplies, EU

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MULTIOBJECTIVE OPTIMIZATION: RECENT APPROACHES

Abstract:

Multiobjective optimization problems (MOPs), i.e. problems dealing with multiple, often conflicting objectives are very commonly encountered in the economics field. Most of the time these problems are approached by classical methods providing only one solution even if – most of the times- there are more equally interesting trade-off solutions for it. During the last years, evolutionary algorithms have become the tool in dealing with multiobjective optimization problems. The main reason is that multiobjective evolutionary algorithms are capable to compute good approximations of the entire set of optimal solutions thus providing the decision maker with a larger – more complete – view of the problem.

Key words: optimization, algorithms, approximations

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ECONOMIC DYNAMIC MODELS USED IN THE DIGITAL BUSINESS ECOSYSTEM

Abstract

Business ecosystem is a new concept that has roots in biological ecosystem. This paper contains a few ideas showing the analogies between natural ecosystems and the business ones. Biological ecosystem and business ecosystem share some fundamental properties such as interaction, interconnectedness and system level behavior. It is also noted that both kind of systems function organically and not like a machine. In addition, neither biological ecosystem or business ecosystem are optimizing anything in their behavior. In business ecosystem the firms are interpreted to be the equivalents of organisms of biological ecosystem.

Key words: business ecosystem, biological ecosystems, optimization

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E_BUSINESS PROCESS MODELS IN VIRTUAL ORGANIZATIONS

Abstact

In today's rapidly evolving world, companies need to adjust their business models constantly to changes in their environment.

The Business Models research in the field of virtual organizations addresses the following questions: What are the appropriate business and revenue models for enabling Virtual Organization frameworks for secure business collaboration over the Internet in Europe and elsewhere? What are the appropriate VO models of execution for enabling collaboration, interaction and sharing between businesses provide better profitability, efficiency and reduced costs?

A business process is understood as a collection of activities designed to produce a specific output for a particular customer or market. It implies a strong emphasis on how the work is done within and organization, in contrast to a product's focus on what. A process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly defined inputs and outputs: a structure for action.

We consider business processes in Virtual Organizations for establish criteria and perspectives in order to evaluate the e-business models based upon interaction, trust establishment, revenue generation and cost management.

Key words: Virtual organizations (VOs), E_Business Process, business models, workflow management

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Agent-Based Modeling of Virtual Organizations

Virtual organizations (VOs) are composed of a number of individuals, departments or organizations each of which has a range of capabilities and resources at their disposal. These VOs are formed so that resources may be pooled and goods or services combined with a view to exploiting a perceived market niche. However, in the modern commercial environment it is essential to respond rapidly to changes in the market to remain competitive.

The domain of agent-based modeling is a vast field of research and technology, so that there is extensive literature distributed under the banners of: business process reengineering, enterprise integration, supply chains, new manufacturing concepts such as agility, virtual manufacturing, electronic commerce [14], and workflow management, etc. that contribute to that field.

Applying agent-based technologies to modeling of virtual organizations results in the emergence of a new field of research and technology under the slogans: intelligent agents in virtual enterprise, agent-based modeling of VO's, agent-based business process management, cooperative enterprise agents.

An interesting feature of this emerging field is that almost all approaches adopt an economic behavior for their agents, that is, agents are supposed to be self-interested so that when combined with autonomy and abilities to cooperate it should yield a behavior similar to that of humans in a market economy, see for example: market-based workflow management, computational markets or economy, market architecture for multi-agent contraction.

Agent-based models and techniques are also being developed for the automated formation and maintenance of VO's. This automated formation and ongoing management of virtual organizations in open environments represents a major research challenge. A key objective in putting such organizations together is to ensure that they are both agile (able to adapt to changing circumstances) and resilient (able to achieve their objectives in a dynamic and uncertain environment). In such environments, the participants' behavior will be informed by exploiting a number of diverse forms of information/advertisements (capabilities and reputations of individual agents), meta-data (schemas and ontologies) and information resources (databases and knowledge bases).

The formation of a virtual organization system is grounded on three key technologies: the decision-making mechanism of an individual agent, an auction mechanism for the allocation of contracts, and the representation of services.

There is a number of important characteristics that must be taken into account in the modeling and operating of an effective VO management system. First, there may be multiple behaviors available from a number of agents representing independent organizations. Multiple agents may present broadly similar behaviors. The behaviors themselves can be described by multiple attributes; for example, price, quality, and delivery time. The behaviors may change over time: for example new products and services may become available, or agents may alter the way in which existing products and services are offered. Products and services may differ in terms of the number and heterogeneity of the tasks involved in the

delivery of them and their degree of interdependence, and the type and frequency of interactions between different customers while a good or service is being delivered.

The agents involved in the system may also employ different policies for dealing with the uncertainty inherent in such a domain; for example, an agent may generate slack resources to limit the possibility of a loss in service to the customer, or it may employ rigorous coordination mechanisms to improve supply chain integration.

Key words: Virtual organizations (VOs), Agent-Based Modeling, virtual manufacturing, workflow management

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A CYBERNETIC APPROACH OF THE TOURISM FIELD

Abstract

The tertiary or service field has become dominant in the post-war period, with the service market ranking ever more importantly, encompassing extremely varied activities, heterogeneous in terms of content, yet taking distinct manifest shapes.

In a systemic approach the services field is a complex and dynamic cybernetic system with its own structure interconnected within the cybernetic system of the national/world economy.

The interdependencies and interactions between the national economy branches, between various fields and activities are enhanced, as the economy grows. Their complexity also deepens, changing from the mere exchange of materials to cooperation ties in manufacturing, to activities of technical progress extension and coverage.

The increasing part played by services in the economic and social life at world level, especially for developed countries, has been interpreted by sociologists as a replacement of "primary civilization" with "tertiary civilization", since a service-dominated society has gradually replaced an agriculture-dominated one. As with any field of activity, the field of services has evolved from initial forms of completing primary activities to the current structures, characterized by a maximum usefulness for individuals and society alike.

In systemic approach the goals (objective functions) would be benefit optimization, local economy structure optimization, BOP balancing, experience optimization and development.

The internal and external environment generate a lot of constrains which have to be taken into consideration. The main of them may be summarized as tourist supply constraints, attractive resource supply constraints based on the limited resource quantitative trait, technical and environmental constraints, time constraints: springing from seasonality and holiday time, administrative and health care constraints comprising drawing up administrative, customs, health care formalities that are necessary in international tourism activities, political, social, ideological, conflictual and army constraints, related to the policy of every country regarding receiving tourism, domestic instability or its involvement in international conflicts, as well as natural disasters that may occur in a region, reception constraints, the tourist and his comfort: comprises the existence of unfit standards for tourism reception structures, unfavorable weather conditions or the lack of natural and cultural attractions, constraints related to maintenance resource limits: stemming from the capacity to valorize the financial availability of any company.

The main objectives of the cybernetic model of tourism field are the determination and the evaluations of the indicators system that must gather within a set as complete as possible and which includes regional and local indicators, sector indicators, resources indicators, results indicators and synthesis indicators.

Keywords: dynamic system, tourism, indicators

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THE TOURISM SYSTEM AND ECONOMIC GROETH.
ELEMENTS AND FACTORS

Abstract:
The results of economic activities become visible through a complex process in which the entire economic system takes part. This process is commonly known as "economic growth" and many specialists consider it to be the sole factor to ensure long term national economic success. The specialized literature mentions a series of concepts which all lead to a single possible conclusion: that economic growth refers to a temporally durable enhancement of macroeconomic results as a result of the increase and efficient use of production factors. Economic growth is concretely observable in the increase of the GNP, GIP and NNP, both per total and per inhabitant, including the structure changes of the respective economy.
The paper presents the main involved factors in the process of economic growth with their quantitative and qualitative aspects.

Keywords: economic growth, GDP, NNP, production factors

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EFFICIENT ALLOCATION FOR A PRINCIPAL-AGENT ENVIRONMENT UNDER ASYMMETRIC INFORMATION

Abstract

In much of the literature on environments with asymmetric information, efficiency is defined with respect to full or symmetric information. As an alternative approach to characterizing efficient allocations and mechanisms we consider explicitly the restrictions imposed by asymmetric information.

In environments with asymmetric information, uncertainty about preferences, technology and endowments may be characterized by probability distributions over unknown shocks or parameters.

The preference ordering of agents are defined using the expected utilities that occupy a special space in our work. We also define efficient allocation mechanisms, Pareto optimal mechanism, as well as their characterization.

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PARTICULARITIES OF SERVICES MARKETING AUDIT

Abstract

The marketing audit literature does not adequately reflect the development of the services marketing field in the recent years. The marketing audit and services marketing literature have developed independently. Our premise is that the marketing audit literature is not sufficiently sensitive to the unique characteristics of services to allow services organizations to reap the full benefits of marketing auditing. This premise prompted us to present a marketing audit framework specifically for service companies.

Keywords: marketing, audit, service companies

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E-LEARNING, A KEY ELEMENT IN THE SMES ORGANIZATIONAL DEVELOPMENT IN THE EUROPEAN UNION ENLARGEMENT CONTEXT

Abstract

E-Learning means using new multimedia technologies and the Internet to improve the quality of learning. By mobilizing and coordinating Europe's efforts, the e-Learning Initiative is playing an important role in helping Europe to realize its potential to be the world leader in learning products and services. The Programme for the Effective Integration of Information and Communication Technologies (ICT) in Education and Training Systems in Europe (2004 – 2006) is a further step towards realizing the vision of technologies serving lifelong learning. It focuses on a set of actions in high priority areas, chosen for their strategic relevance to the modernization of Europe's education and training systems. We can also speak about a future paradigm: social e-Learning, which means setting up a socially inclusive e-Learning environment within the European Union context. It is also remarkable that all new European Union member countries from May 2004 and the candidate ones have undertaken a clear and tangible political commitment to facilitate the implementation of the Information Society.

In this context the purpose of this article is to analyze e-learning concept, the differences between e-learning and the traditional education and the perspective of e-working in the near future. Special attention must be given to e-learning seen as a key in improving Romanian SMEs employees' performance in the context of integration of Romania in European Union in 2007, when the Romanian SMEs must face the European Union strong competition.

Keywords: education, e-learning, social e-learning, SME, organization development, strategic development

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A KNOWLEDGE-DRIVEN OPERATIONAL FRAMEWORK FOR VIRTUAL ENTERPRISES: BUILDING DOMAIN ONTOLOGIES TO SUPPORT SEMANTIC WEB SERVICES

Abstract

*The Semantic Web vision and the ontology learning challenge. The Semantic Web is a visionary project launched by Tim Berners-Lee (the World Wide Web inventor) that aims to enhance the usability and usefulness of the Web by enabling computers to find, read, understand and use the content of Web documents in order to accomplish tasks via automated agents and Web-based services. For adding meaning to Web pages, in order to make the data also machine-understandable, Berners-Lee suggests to enrich the Web by annotating document content using semantic information from newly generated domain ontologies. An efficient solution is to learn ontologies, and/or instances of their concepts, in a (semi)-automatic way. Web Mining techniques could be used to accelerate the ontology building process, by applying them to discover and extract the semantics from the unstructured Web documents and to conceptualize the underlying information in terms of explicit and formalized knowledge. Capturing consensual knowledge by building ontologies. From a computer science viewpoint, ontologies are aimed at capturing and formalizing consensual knowledge by forming a meaningful hierarchy of terms (concepts) along with the relations between them. Knowledge in ontologies is formalized using five kinds of components: classes, relations, functions, axioms and instances. Building ontologies is a complex task and needs at least a partial automatization of the knowledge acquisition process that can be carried out by natural language analysis and machine learning techniques. Ontology alignment, mapping and merging methods are also important because several ontologies may coexist. Formalization is not the only requirement for an ontology. It has to fulfil stronger requirements: correctness, consistency, completeness, conciseness, etc. Many tools and environments have been created for building ontologies, for ontology merging, integration, storage, querying, learning and evaluation, for managing ontological annotations, for extracting ontologies from texts, etc. Recently, many languages have been developed in the context of the World Wide Web (and have had great impact in the development of the Semantic Web): RDF, RDF Schema, SHOE, XOL, OML, OIL, DAML+OIL and OWL. Their syntax is based on XML, a markup language that has been widely adopted as a standard language for exchanging information on the web. Ontologies play a key role in the framework of modelling knowledge in corporate knowledge management systems, as they model the main information used inside the organization, and provide a shared view of it. Many efforts are directed towards developing technology and tools for rapidly constructing intelligent agents to extract, query, and integrate data from web sources. Ontology-driven information retrieval is an application in which users can pose queries to the systems and it retrieves relevant information for them. The Web evolution is oriented to provide services, which perform operations requested by user or agents. Frameworks commonly used for Web Services are: UDDI (Universal Description, Discovery and Integration); WSDL (Web Services Description Language); WSFL (Web Services Flow Language); ebXML (Electronic Business XML); WSCA (Web Services Conceptual Architecture). Semantic Web Services are Web services described using a semantic markup language, such as OWL or DAML+OIL. With the semantic markup of a service, its properties, capabilities, interfaces and effects could be interpreted by other services in order to perform automatic discovery, execution or composition of such services. **Using Web Mining to discover semantics on Web and learn ontologies.** Web mining is concerned with discovering patterns or knowledge from web*

documents, or web log files, which usually represent unstructured relationships with little machine-readable semantics. Web mining is classified into three main domains: web content mining, web structure mining, and web usage mining. Therefore, it can address the problem of discovering semantics in Web pages by content, by structure and by usage. Web content mining has an important role in building or enriching existing conceptualizations (ontologies) behind Web sites and provides the most valuable support for instance learning. Ontology learning designates the semi-automatic extraction of semantics from the Web. Methods for discovering semantics are equally required for merging and mapping ontologies. Instance learning is an essential task in the context of Semantic Web vision and relies on using automatic or semi-automatic methods for extracting information from Web-related documents as instances of concepts from an ontology, either for helping authors to annotate new documents or for extracting additional information from existing unstructured or partially structured documents. Text mining provides support for instance learning within an ontological framework. It may allow for the automatic attachment of meta-data, in the form of RDF tags, to a collection of originally purely ASCII documents. Discovering semantics by structure commonly relies on the hyperlink structure of Web pages. Finally, extracting semantic relations from the usage of a Web site can be also interpreted as a kind of ontology learning, revealing the user behaviour. Semantic Web in conjunction with Web mining could produce synergic effects.

***Semantic (automatic) annotation.** An intelligent, document centric Knowledge Management (KM) process, must handle three classes of data: ontologies, documents and annotations. Semantic annotation uses domain ontologies to identify concepts and relations between concepts in documents. It produces Web pages with machine interpretable mark-up that provide the source material with which agents and Semantic Web services operate. Improving interoperability and enhancing information retrieval are the major benefits. Automation is also needed to facilitate knowledge acquisition, particularly for large collections of documents. Tools for annotating text could refer to wrappers, supervised or unsupervised machine learning techniques, and natural language processing systems.*

***Building domain ontologies for describing and helping to compose semantic Web services.** The real value of Web services is in their composition, which allows creating new and complex functionalities from the existing services. Unfortunately, finding and composing services requires manual effort. To facilitate their discovery and integration, Web services could be augmented with a semantic description of their functionality, starting from available WSDL files or activity logs. Developing tool support for (semi-)automatic ontology learning in the context of Web services can be also addressed by designing a framework for learning ontologies from textual Web service descriptions.*

***Conclusion.** Semantic Web technology, including ontology languages, repositories with semantically annotated documents, intelligent agents, machine learning tools and query languages, provides scalable methods and tools for the machine-accessible representation and manipulation of knowledge. Traditional Web services support the remote invocation of business functionality over the Internet through exchange of well defined standardized messages. Additionally, Semantic Web services are capable to make use of Semantic Web technology to support the automated discovery, substitution, composition and execution of software components (namely, Web services). In the context of this new digital environment, ontology-based systems appear as a central issue for the development of efficient and profitable solutions to supporting e-business activities within Virtual Organizations. Sharing ontologies could be a basis for interoperation among trading partners in electronic markets. An ontology based approach has the potential to significantly accelerate the economic development and to increase the competitiveness, by enabling services to adapt to the rapidly changing online environment.*

Key words: Building domain ontologies, Semantic Web services, Virtual enterprises

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SELF-ORGANIZATION AND EMERGENT BEHAVIOURS IN DIGITAL BUSINESS ECOSYSTEMS: CONCEPTUAL AND PRACTICAL ISSUES

Abstract

Digital business ecosystems as complex, self-organizing and evolving systems. The concepts of self-organization and emergence have crucial implications for explanation, understanding and prediction in Digital Business Ecosystems (DBE), which are part of the next generation of Information and Communication Technology (ICT). In essence, DBE is an emerging paradigm for economic and technological innovation. It is based on a global network environment, in which business will be able to interact with each other in very effective and efficient ways. This allows providing networked organizations with a self-organizing digital infrastructure for supporting the cooperation, innovation, competitiveness, knowledge forming, knowledge sharing and development of open and adaptive technologies.

Emergent behaviours and self-organization. The defining characteristic of a complex system is that some of its global behaviours, which are the result of interactions between a large number of relatively simple parts, cannot be predicted simply from the rules of those underlying interactions. These phenomena are commonly referred to as emergent behaviours. They don't seem to have any clear explanation in terms of the system's constituent parts. In other words, complex systems produce behavioural patterns and properties that cannot be predicted from knowledge of their parts taken in isolation. A definition for emergence could be based upon a notion of predictive complexity. True emergent phenomena are those for which the optimal means of prediction is only simulation. In simulation we proceed by induction rather than deduction. It allows determining the outcome of complex systems for different set of inputs in a way that makes our understanding of a phenomenon more and more accurate when more and more facts are accumulated. Self-organization refers to the process by which a system changes its internal organization to adapt to changes in its goals and environment without explicit external control. This can often result in emergent behaviour that may or may not be desirable.

Agent based solutions to self-referential problems, proactive behaviours and bounded rationality. Agent-based computing provides a means to simulate complex, self-organizing systems. The major challenge is related to the development of agent-based simulation models which involve cognitive and rational agents. An important question is whether agents are fully rational (in the sense that their expectations are consistent with the dynamics induced by the actual law of motion of the economy), or only boundedly rational (when their expectations are formed based upon a perceived low of motion that differs from the actual one). Adaptive learning procedures are typically associated with the hypothesis that agents are boundedly rational, exhibit heterogeneous beliefs and evolve within a competitive environment, where they mutually interact. Agents learn in the sense that the perceived law of motion is updated using time series observations on certain economic variables. The learning methods could be either conventional or based on computational intelligence approaches (genetic algorithms, neural networks, etc).

Simulation of digital ecosystems in financial markets using agent-based models. Financial markets are typical examples of complex, self-organizing and evolving ecosystems. Agent-based models proved to be the most powerful tool for the simulation of emergent behaviours that currently occur in these markets. They are well adapted to describe macro features emerging from interacting strategies and allow understanding the impact of agent interactions and group learning dynamics in a financial setting. Building the Santa Fe artificial stock market was the early most remarkably example of simulating emergence in a complex

self-organizing and evolving system. It consisted of creating a digital environment, in order to allow experimenting and testing stock market theories, manipulating individual trader strategies and various market parameters that would not be allowed on a real stock exchange. Agent rule sets can be seen as a digital ecosystem (or, in other words, an "ecology of trading strategies"), because they evolve over time. Some learning mechanism based on a genetic algorithm is used to modify the trading rules, which allows studying the emergence of trading patterns as agents learned over time. New rules are generated by choosing parents, and implementing crossover and mutation operators on them.

Computational Intelligence Based Approaches to Adaptive Learning under Bounded Rationality. In order to be competitive on market, agents have to be able of forming rational expectations. When facing model misspecification (i.e., the true nonlinear functional form of the model is unknown) they must approximate rational expectations as a result of a learning process. An auxiliary model is required to accomplish this process, based on the assumption that it is flexible enough to represent various kinds of possible relationships between the relevant variables. Neural networks might be well suited for this task, due to their two characteristics mentioned above. Using the inductive capabilities of neural networks, the agents may be able to learn the formation of rational expectations, without the requirement of specifying *ex ante* the true nonlinear functional form of the model. A neural network based model is introduced to exemplify the way agents learn to form expectations.

The infrastructure of DBE to supporting business activities in real marketplaces. The infrastructure of a digital ecosystem should be based on open-source technologies and open standards. It should mediate the formalisation of knowledge in SME networks, the creation of software services, and the B2B interactions between the SMEs. The service composition can only be realised through a sophisticated infrastructure for the construction, operation, and optimisation of the digital ecosystem. The main components of this infrastructure are: the Service Factory (SF), the Execution Environment (ExE), and the Evolutionary Environment (EvE), respectively. The starting point is to make the SMEs the owners of the tools with which they will build, operate, and optimise their ecosystems. This is why the infrastructure must be open-source. The Service Factory (SF) groups several functional components such as the DBE Studio, the distributed Model Repository, the Service Composer, and the Testing Environment. The DBE Studio is an Integrated Development Environment (IDE) for Digital Business Ecosystems that includes Eclipse plugins that allow business services to be analysed, and corresponding software services to be defined, developed and deployed. The link between the SF and the ExE is provided by the Service Manifest (SM). The Service Manifest is a two-fold formal description of a specific DBE Service, and contains the data of a single specific real word service owned by a specific SME, comprising both business and technological information at model and data level. The Execution Environment (ExE) is a Peer to Peer (P2P) platform that allows the sharing of services and data between companies. The distributed digital ecosystem Evolutionary Environment (EvE) relies on the dynamic memory mechanisms of the ExE to support service migration, cluster formation according to business domains and industry sectors, the search and discovery of optimal services in response to user requests, and the optimisation of service chains. For dynamically describing, discovering, composing, monitoring, managing, and adapting multiple services in support of digital business ecosystems, *agent-oriented architectures* based on peer-to-peer structures are needed.

Conclusion. This paper was intended to summarize the key concepts for supporting the development of Digital Business Ecosystems, which is emerging worldwide as an innovative approach to economic and technological innovation. We shown that it is deeply originated in the foundational theories of systemic, behavioural and complexity sciences and relates to the vision on how such evolutionary self-organizing systems (SMEs, for example) survive and evolve within a digital environment based on the new ITC infrastructure.

Key words: Digital Business Ecosystems, Self-organization, Emergent Behaviours

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VIRTUAL ENTERPISE - PAST AND FUTURE

Abstract:

In the last period, the corporations have developed their activity over the national borders and even the continent, activity being now easier because of ITC support. The political changes in today world have opened new markets for the existing corporation. Also, differences between countries regarding production costs impose as reliable economical solution, to open local production facilities, by building, merging with, or acquisition of local already present factories.

Today software systems have become essential parts of our everyday life. Computers are used in all fields of human activity.

A virtual enterprise is an organizational concept which brings independent partners together to fulfill a unique market opportunity and dissolves upon completion of the project. The partners or entities shall contribute with their core competence and thereby generate a "best-of-breed" construct in respect of required expertise. The global market increases the need for common and collaborative processes and sharing information seamlessly between companies involved in a Virtual Enterprise (VE). The new requirements are much more focused on collaborative processes that handle product definition data. Partners in the extended enterprise need to exchange legacy data and migrate with other systems outside their own secure corporate boundary.

More and more organizations become networked organization, being composed by multinational firms, as effect of globalization expressed in European work space. In networked environment, new approaches inspire the today society. The new generation of organization will be very dynamic, with a great adaptability for up-to-day changes, keeping a core business, the rest being externalized as out-sourcing practice. The global market increases the need for common and collaborative processes and sharing information seamlessly between companies involved in a Virtual Enterprise. The new requirements are much more focused on collaborative processes that handle product definition data. Partners in the extended enterprise need to exchange legacy data and migrate with other systems outside their own secure corporate boundary.

The global manufacturing enterprise can be viewed as a collection of interconnected virtual and/or real entities and the whole manufacturing systems will be represented by the society of manufacturing agents, in which every agent will be doing specific tasks (design, planning, manufacturing, control and diagnosis, marketing etc.). The over all system will evolve out of their collective interactions.

There for, is important for those enterprises to be able to develop their ability in involving themselves in international projects, where they can cover using their skills specific tasks, modules of the project proposed by the big enterprises who are leading the field. The scope of the virtual enterprise discussed in this paper is relatively narrow in terms of the business and engineering activities considered for the collaboration. The virtual enterprise in this paper is somewhat similar to a supply chain system, synchronizing manufacturing

processes in each member company by using shared information within and among firms. Such enterprise integration requires sophisticated process specifications for business activities and a well-defined information communication structure. The specification of a virtual enterprise includes physical transactions of manufacturing and the transportation system, as well as informational transactions of planning, data processing, manufacturing management transactions, and negotiation among member firms in the virtual enterprise.

To facilitate the creation of virtual enterprises, potential partners must be able to quickly evaluate whether it will be profitable for them to participate in a proposed enterprise. One of the greatest challenges of a virtual enterprise is to organize and get a global prospective of projects in progress. Validation of the project planner gives the organization better flexibility and control on who gets in, who sees what and what tools they have the right to use. Simulation technology in general, and distributed simulation technology in particular, can facilitate the evaluation process.

Nowadays, the management of interoperable business processes may be seen as one of the most important success factors for collaborative enterprises. Flexibility and the capability to manage these processes are considered at this as central requirements to reach necessary entrepreneurial interoperability.

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SERVICES–ORIENTED ARCHITECTURES – A NECESSITY OF CONTEMPORARY ECONOMY

Abstract
The globalization of businesses and markets forces enterprises to act promptly, to form strategic alliances, to merge with other enterprises, even with competitors, to find new forms of management and production, new opportunities and forms of businesses, new possibilities of promotion for market promotion and new ways of transmitting and processing data, especially in the area of information and communication technologies.

New and challenging problems arise or the business environment, as well as for the developers of information systems. They include the necessity to be flexible and adaptable to deal with market change, to be efficient in resource allocation and use, including the IT infrastructure, and to be anticipative.

*Under these circumstances, the new concept of **Services-Oriented Architectures (SOA)** comes as a response to these challenges, providing solutions for business development, information systems adaptation and integration.*

The article presents some of the elements that characterize this type of architectures, providing examples for the most commonly used software instruments on the software market.

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MARKETING FORECASTS BY USING THE REGRESSION MULTIFACTORIAL MODEL

Abstract

Market research is vital for company business good development, for providing goods delivery on internal and external market, for micro and macroeconomic substantiation and justification of investments, for long run profitability microeconomic programming. Statistical instruments are used in several phases of market research, since the phase of working out the research program till the phase of interpretation and analysis of market information, supplying company's manager the possibility of the rightly decisions-making. The correlation and regression techniques aim at defining the relationship notion between a dependent variable and one or several independent variables.

Marketing forecasts represent the estimations of the future marketing variables.

 In this way, marketing forecasts are attempts to forecast the future of marketing variables, on the basis of their past estimation. Marketing decisions quality concerning the economic activity management depends upon the forecasting accuracy.

Marketing forecasts can be performed at the level of product, group of products, economic unit, activity branch, or of certain territorial-administrative units, national, international level etc.

Forecasts are difficult to be achieved due to demand instability, but they are important to company success.

Forecasting can be made in three phases:
- *macroeconomic forecasting;*
- *industrial forecasting;*
- *company sales forecasting.*

Macroeconomic forecasting refers to inflation, unemployment, interest rate, consumption expenses, exports, imports etc., the final result being the GNP. On the basis of GNP, forecasting is made at industry level, the company going to deduce its own sales, according to market shares.

Forecasting uses three types of information:
- *consumers' opinions, known by means of surveys on buyers' intentions, by selling agents' opinions, by experts' opinions;*
- *consumers' behaviour settled by a market test, in order to see which are the buyers' reactions;*
- *consumers' previous behaviour involving the analysis of previously buying behaviour.*

This can be analyzed by using the multiple regression that considers the future and the past sales as a time function, finding the factors which affect the sales and their relative importance.

Keywords: market research, forecasting, consumer behavior

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DEMOGRAPHIC CHANGES AND THEIR IMPACT ON PUBLIC FINANCIAL SYSTEM OF ROMANIA

Abstract

The rise in life expectancy and the continuing drop in birth rates will radicaly change the structure of Romanian´s population. According to the demographic projections the old-age dependency ratio might more than double from the current 21,1% to 51,1% by 2050 that implies Romania will have only two people of working age for every elderly person. This is the greatest challenge for social policies, because on the one hand is needed to rise the living standard of the olders, and on the other hand to ensure the sustenability of public financial system.

Keywords: life expectancy, demographic projections

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NEW TOOLS OF THE MODERN ECONOMIST

Abstract

The modern economists (professors, decision makers, managers'assistants, consultants, infoprenors, infobrokers), like the alchemists in the old times, have found ourselves in the situation of finding the philosopher's stone, because the moldings of these phenomena require philosophical, economical, sociological, psychological and ecological information, and the work of integration, processing, deciphering and interpretation is laborious and the results cannot be always easily revealed. The advent of the most contemporary thesis, Globalization, Systems, Information Theories, Information Technology, Corporate Blogs has provided a new conceptual approach and new informational environment for the modern economists to understand and apply.

Keywords: informational theory, statistics, globalization, economics, turbomarketing, corporate blogs

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LOOKING FOR INTERACTIONS WITH INFORMATIONAL STATISTICS

Abstract
There are many years since Onicescu's Informational Statistics vs Shannon's has excited us from a different point of view than has done it with those who are passionate of science, of scientific culture history, with philosophers or seekers of information value. We were surprised by the inside symmetry, the balance between individual and general, analytic and holistic, considering the new Paradigms and models on which you can apply cybernetics and statistic instruments with the most subtle possible experiments.

Key words: informational theory, informational statistics, Romanian scientists.

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INTEGRATING RISK MANAGEMENT INTO DECISION MAKING

Abstract

Effective risk management cannot be practised in isolation, but needs to be built into existing decision-making structures and processes. As risk management is an essential component of good management, integrating the risk management function into existing strategic management and operational processes will ensure that risk management is an integral part of day-to-day activities. In addition, companies can capitalize on existing capacity and capabilities (e.g., communications, committee structures, existing roles and responsibilities, etc.)

Keywords: risk management, companies capabilities

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RISK MANAGEMENT IN LARGE COMPANIES

Abstract

Risk is inherent in large companies. This paper explores the challenges of risk modeling in such systems, and suggests a risk modeling approach that is responsive to the requirements of complex activities from large companies.

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AGENT TECHNOLOGIES IN IT PROJECT

Abstract
 Different approaches to project planning and scheduling have been developed. The Operational Research (OR) approach provides two major planning techniques: CPM and PERT. Artificial Intelligence (AI) initially promoted the automatic planner concept. In order to plan a project, the automatic application of predefined operators is required. However, most domains are not so easily formalized in the form of predefined planning operators. The new AI approaches promote model-based planning and scheduling. The paper focus is on the agent-based approach to project planning and scheduling, especially in Resource Leveling issues. The authors have developed and implemented the ResourceLeveler system, an agent-based model for leveling project resources. The objective of Resource Leveler is to find a scheduling of resources similar to the optimal theoretical solution which takes into consideration all constraints stemming from the relationships between projects, activity calendars, resource calendars, resource allotment to the activities and resource availability. ResourceLeveler was developed in C# as a plug-in for Microsoft Project. The program has the following functional modules: the interface module, the wrapper module, the leveling module, and the auction market simulation module.

The leveling is realized by analyzing the work periods with a certain precision (hour or day) from the beginning of the project to its end. For each of these periods the program runs a negotiation round between the agents which represent the tasks in the frame of a virtual market that simulates a resource auction.

The market has the objective of deciding the winning offers and, implicitly, the activities which will be planned for the specified time span. Every offer received from the agents contains the desired resources and the required quantity as well as a price which characterizes the estimate value of the resources at the moment of auction for the agent.

The agents who represent the actions decide the leveling strategy because the price generated by the offers determines the task's importance in the present context. In order to set up a price, the agent uses a database that contains all considered elements. Some characteristics are common to all agents and represent proprieties of the project (for example the dependence graph between tasks), while other characteristics are specific to the represented activity. In the following we will present the main components of ResourceLeveler.

We have compared ResourceLeveler with other resource leveling tools and have observed that ResourceLeveler has brought better results than the leveler implemented in Microsoft Project and found better solutions to some problems than other leveling tools.

Keywords: *agent-based models, artificial intelligence, leveling performance, project resource leveling.*