

SECTION 4

Information Technologies for Macroeconomics and Microeconomics

Room 2710

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Thursday, April 22, 2004

11,30-11,45 1. *Software Cloning by Translation Processes*

Authors:

Professor **Ion Ivan**, PhD, Academy of Economic Studies, Bucharest, Romania

Robert Enyedi

Assistant **Marius POPA**, Academy of Economic Studies, Bucharest, Romania;

Abstract

In this paper there are defined and presented concepts regarding the applications translations from a programming language in another. Also, there are presented some techniques to obtain informatics clones and scenarios regarding the translations structure, the applications translation, the steps passed through in the translation process. At same the time, these elements are relieved in a translation example for a code fragment from Pascal in C++. It is defined the concept of informatics clone, there are relieved the applied techniques in the informatics cloning process. There are named the elements regarding the juridical aspects of the informatics clone and some criteria to establish the value of the indicators used in the analysis of the translated software products orthogonality.

Keywords: translation, software cloning, orthogonality

2. *Hardware and software client/server,*

11,45-12,00 *Authors:*

Professor **Dodescu Gh.**, PhD, Academy of Economic Studies, Bucharest, Romania;

3. *Managing e-business applications,*

12,00-12,15 *Authors:*

Professor **Floarea Nastase**, PhD, Academy of Economic Studies, Bucharest, Romania;

Abstract

Most organizations, commercial, governmental, and non-profit alike, have established a presence on the World Wide Web for specific purposes, the major one being to provide faster and more cost effective service than using traditional technologies, such as telephone, fax and mail. A typical business application depends not only on the hardware and networking, but also on software ranging from the operating system to middleware such as databases, Web servers and

messaging, to the applications themselves. Service Level Management is a means for the Lines Of Business (LOB) and an IT organization to explicitly set their mutual expectations for the content and extent of IT services. It also allows them to determine, in advance, the steps that will be taken if these conditions are not met. The concept and application of Service Level Management allows IT organizations to provide a business-oriented, enterprise-wide service by varying the type, cost, and level of service for the individual LOB.

4. Information Security Management Systems,

Authors:

12,15-12,30 Senior Lecturer **Razvan Zota**, PhD, Academy of Economic Studies, Bucharest, Romania,
Assistant Professor **Radu Constantinescu**, Academy of Economic Studies, Bucharest, Romania,
Assistant Professor **Alexandru Barbulescu**, Academy of Economic Studies, Bucharest, Romania;

Abstract

The perspective of Romanian integration in EU structures has determined the need to align the political, social, cultural and economical infrastructure to the requirements of the European standards. The information security is a very important issue of nowadays. Whatever form the information takes, or means by which it is shared or stored, it should always be appropriately protected. A written policy on security management allows every area in the business to understand its responsibilities. Companies have to be certificated in order to achieve credibility and to protect from the various external factors that threatens their activity.

5. Information Technology Suport for Macroeconomics,

12,30-12,45 Authors:

Lecturer **Iulian Intorsureanu**, PhD, ASE Bucharest;

Abstract

This paper aims to examine the current situation on the market of software tools for macroeconomics. The available tools, which are identified by Internet search, are structured with regard to fields of functionality and supported models. The extent to which this software is used in research on one hand, and by the decision factors on the other hand.

6. "The Economics Pack" - a helpful software tool,

12,45-13,00 Authors:

Lecturer **Ovidiu Veghes**, PhD, Academy of Economic Studies, Bucharest, Romania;

Abstract

Mathematica®, from Wolfram Research, Inc., is a language to do Mathematics with the computer. But this software is not specialized to solve an economic problem. Thomas Cool had developed, since 1993, a set of routines in order to solve some economic, business and finance problems. An user guide helps persevering people to learn how to use these routines. We make a short presentation of the software package and propose a structure for its didactical exposition. On this occasion, it is not our intention to show how a solution routine has been programmed. This paper was possible due to the aquisitions made by the Mathematics Department within the Academy of Economic Studies, Bucharest, during the last years.

13,00-13,15 7. *Using BBN modeling to certifying the reliability of commercial off-the-shelf software systems,*

Authors:

Lecturer **Marian Cristescu**, PhD, Department of Economic Informatics, “Lucian Blaga” University of Sibiu;

Abstract

Best practices indicate that totally independent certification is the only safe approach to take when certifying a system assembled from Commercial Off-The-Shelf (COTS) software components. We explore one method of certifying the reliability of COTS software systems in this paper. Certifying the reliability of a COTS software system can be problematic, given that we may have incomplete knowledge of a component and its ability to interact in a reliable manner with other components; many times, all we have to evaluate is the behavior of the components as described by their vendor(s) and evidence gathered during testing.

We offer a Bayesian Belief Network (BBN) that will help us resolve what we believe to be one of the major areas of uncertainty in certifying the reliability of a COTS software system and develop a reasoned level of belief in the reliability of the system in this work. Uncertainty is inherent and inevitable in software development processes and products. Active research is being performed in COTS software risk management, and several achievements have been published.

However, uncertainties in COTS software remain largely unexplored, and this problem has caught researchers’ attention since no one can use a system without the certain certified reliability.

Our overall goal is to develop a systematic framework to interpret the sources of uncertainties inherent in COTS software using BBNs. A set of BBNs will be designed to represent different types of uncertainty in the COTS software certification process. We will use the Object Oriented BBN methodology to frame all the BBNs related to the set of uncertainties.

The BBN will provide a quantitative measure of the system’s reliability. Bayesian Belief Networks (BBNs) are a network-based framework for representing and analyzing models involving uncertainty. BBNs come from the disciplines of probability, artificial intelligence, and decision analysis. BBNs have established themselves as an effective and principled framework for knowledge representation and reasoning under uncertainty. BBNs exploit conditional independence relationships to create natural and compact domain models, thereby supporting useful reasoning patterns, and providing effective probabilistic inference and learning algorithms.

The development of efficient and effective propagation algorithms, followed by the availability of easy to use commercial software and growing number of creative applications, made BBNs an attractive formalism to researchers from a number of different fields beginning in the early 1990s. After a decade of research, BBNs have been successfully used to create models in areas such as intelligent decision, safety assessment, medical diagnosis, pattern recognition, and computer network diagnosis.

One main reason for the widespread use of BBNs is that they enable us to model and reason about uncertainty. Typically in BBN modeling, we assign a Bayesian belief value to each uncertain event. All these probabilities for the uncertain events come from people’s subjective judgments that are determined by collecting empirical, historical or statistical data. When we are dealing engineering projects, these probabilities can be decided by domain experts such as project managers, lead designers, senior programmers, and test researchers. In BBN modeling, the probability representations of uncertainties are assigned as the prior belief values to each node in a BBN.

8. A cost estimation model for OO software development,
13,15-13,30 Authors:

Lecturer **Marian Cristescu**, PhD, Department of Economic Informatics, “Lucian Blaga” University of Sibiu;

Abstract

A software development process can be schematized by the sequential phases of system feasibility, problem analysis, software design, coding and testing. For a procedural software, these phases usually follow a waterfall development process model. This model assumes that the software is developed in subsequent stages and every requirement is known up front, so that tasks can be executed one at a time.

The waterfall model is highly structured: a new product is analyzed, designed and produced in clearly articulated, sequential phases. Such a process usually begins with the identification of the users' needs. Then, a detailed set of product specifications is created and the attention shifts to the design phase. The procedural software is made of a set of instructions executing a sequence of elementary actions, so that the developers must be careful to design procedures and algorithms. Errors in the earlier steps of the process would result very expensive, due to the difficult software adjustments.

Different software development models, such as the evolutionary model, consist of many cycles of the process development, so that the software can be iteratively and incrementally modified. The iterative development supports the cyclic improvement of the system components.

The incremental development allows to split the system in different parts, which can be developed in subsequent steps. Iterative and incremental development can be used alone or together. This kind of development model, however, generally cannot be applied to procedural software.

For the OOT, on the contrary, the logic underlying the waterfall model, single-project oriented, does not perfectly match with the typical OO logic of modularity and component reusability, while the application of the evolutionary model allows to exploit the OOT characteristics. In fact, the OO software can be developed starting from a few known problem requirements, thus building an initial, transient version of the software, and then, as the problem requirements are more defined, the software can be completed by adding new software components and/or improving the existing ones.

The adoption of the evolutionary development process model leads to carry out at the end of each iteration intermediate software products: the prototypes. These are approximate versions of the software that improve as the development process goes on. This approach allows also a more effective control of the overall product by the client. Changes in the product requirements can be tolerated even if the analysis and design phases are already advanced. In addition, the overlapping of the development phases yields a time-to-market reduction.

With the evolutionary model, the process development phases are performed in each iteration, and the resulting prototype is evaluated in order to find errors to be corrected in the next iteration.

The analysis consists of building an abstract model of the problem solution, even if there is a close correspondence between the abstract entities (objects) and the related real-world objects. In fact, unlike the procedural software, where procedures are the fundamental software building blocks, an OO software is a collection of interacting objects that model the real world entities. This problem representation can be carried out by several methodologies, but there is no standard accepted methodology

15,30-15,45 *9. VPN - Next Generation Network,*

Authors:

Assistant Professor **Mlak Madalina**, PhD Student, Academy of Economic Studies, Bucharest, România;

Abstract

The present paper consists includes: definition of VPN, users of VPN, the aspects and requirements for implementation VPN, the questions that a specialist needs to answer before choosing the final VPN implementation, risks and benefits of VPN implementation, VPN architecture, VPN scalability and manageability, VPN security, benefits and risks associated with VPN implementation.

Keywords: Networks, VPN, security

15,45-16,00 *10. Formal Specification of Business Components,*

Authors:

Teaching Assistant **Oana Muntean**, PhD Student, Academy of Economic Studies, Bucharest, România;

Teaching Assistant **Anca Andronescu**, PhD Student, Academy of Economic Studies, Bucharest, România;

16,00-16,15 *11. Operating Systems for Parallel Processing,*

Authors:

Alecu Felician, Academy of Economic Studies, Bucharest, Romania;

Abstract

A business component is a component that offers a certain set of services of a given business domain. In order to assemble business components with little effort to customer-individual application systems, it is necessary to establish functional, content-related and methodical standards. The methodical standard provides the necessary framework, respectively the notations that have to be regarded for the specification of business components in order to simplify their reusability between companies and software developers.

16,15-16,30 *12. Multidimensional and Hierarchical Structure of Networks,*

Authors:

Acalugaritei Gavril

16,30-16,45 *13. Beowulf Clusters,*

Authors:

Bologa Razvan, Academy of Economic Studies, Bucharest, Romania;

Abstract

The article presents a few fundamental elements regarding the Beowulf clusters. It is intended to attract the attention of those interested in parallel computation and parallel machines. The main issue that will be discussed in the bellow paragraphs is the concept of Beowulf. A presentation of the performance of Beowulf clusters is also available in the secondt part of the article.

16,45-17,00 **14. EbXML - Creating a Single Global Electronic Market,**

Authors:

Irimia Laura Angela, Master E-business;

Abstract

EbXML is a joint venture between OASIS and UN/CEFACT. The vision of the ebXML project is the enabling of a global electronic marketplace where enterprises of any size and in any geographic location can meet and conduct business with each other by exchanging XML –based messages.

The ebXML project defines an entire e-commerce infrastructure, of which the registry is an integral part.

The ebXML Registry provides a set of services that enables sharing of information between interested parties for the purpose of enabling business process integration between such parties based on the ebXML specifications. The shared information is maintained as objects in a repository and managed by the ebXML Registry Services.

A Registry Services may be implemented in several ways including, as a public web site, as a private web site, hosted by an ASP or hosted by a VPN provider. The Registry Client interfaces may be local to the registry or local to the user and the interfaces communicate with the Registry over the Internet.

The minimum-security policy for an ebXML registry is to accept content from any client if a certificate issued by a Certificate Authority recognized by the ebXML registry digitally signs the content.

To search for or query different kind of registry objects in the ebXML Registry is used the QueryManager and supports two query capabilities: Filter Query and SQL Query.

The Registry Information Model provides a high-level schema for the ebXML Registry. It contain information on the type of metadata that is stored in the Registry as well as the relationships among metadata Classes. An information model is a representation of the components that compose a system and the relationship between those components.

17,00-17,15 **15. Incentives to Invest in Transport Cost Reduction - Conceptual Issues and an Application to Electronic Commerce,**

Authors:

Oprea Ionut, Academy of Economic Studies, Bucharest, Romania;

Abstract

Do firms have proper incentives to invest in transport cost reduction? We discuss this question in a duopoly with a local firm and a distant competitor that may invest in a reduction of marginal transportation costs. In a two-stage game with investment in the first and duopoly competition in the second stage, we compare profit-maximizing investment with (constrained) welfare maximization by a social planner. Intuitively, a firm will overinvest if the negative impact on its competitor exceeds the gain in consumer surplus. We analyze how the relative strength of these two effects depends on market demand, firm conduct and investment costs. Applying our results to electronic commerce, we argue that for physical goods either overinvestment or the efficient decision not to invest is the most likely outcome while the specific characteristics of digital products yield either underinvestment or an efficient investment level that reduces transportation costs to zero.

Niche Markets and Electronic Commerce

This paper investigates e-commerce strategies when in addition to the price, firms can control the size of the market area. Due to the shape of the commercial costs (e.g. costs of the e-commerce

activity) the following results emerge: 1) if the average costs of commercial are decreasing in the market area size, firms serve the entire market, 2) if the average costs are U-shaped firms decide to limit the market area, 3) the firms' behaviour is socially optimal. The paper also analyses the quality of the web-service, the formation of trade areas and the role of transport costs.

17,15-17,30 **16. OLAP technology – a new information technology for
Macroeconomics,**

Authors:

Lecturer **Mihaela Muntean**, PhD, Academy of Economic Studies,
Bucharest, Romania;

Abstract

The current society evolves to an informational society and for this reason the role of informatics as a producer and a consumer of information is decisive. In the competitive market, any modern organization must adapt to new informational economy. Managers must manipulate the corporate data quickly and intuitively in order to provide analytical insight and make strategic and tactical decisions based on corporate information. Today the concept of OLAP is analogous with success in business.

The OLAP technology is a key factor in the interactive analysis of enterprise data for decision-making purposes.

The OLAP technology offers a good conceptual fit with the way managers visualize business data and ability to integrate and analyze large volumes of enterprise data.

Friday, April 23,2004

Chairman: Professor **Paun Mihai** PhD

14,30-14,45 **17. Business Intelligence Systems –support for enterprise decision
makers,**

Authors:

Lecturer **Mihaela Muntean**, PhD, Academy of Economic Studies,
Bucharest, Romania;

Abstract

This paper discuss about Business Intelligence technology (BI), which are now a driving force within leading organizations. BI provides the ability to gain insight into the organization's markets and internal operations and allow organizations to react quickly to a changing environment and to plan for the future. BI provides information and analytical capabilities to business people with the insights to solve problems.

There are three primary factors that have acted to drive the adoption of business intelligence systems:

- Data warehouses that are used to store large volumes of detailed information about markets and internal performance measures that was well structured for analysis.
- The Internet that offers access for large numbers of users to business intelligence solutions. Organizations need to distribute information both within the enterprise and externally to customers and suppliers.
- The use of business intelligence applications has become a competitive necessity. The organizations require a variety of business intelligence applications such as: reporting applications, ad-hoc query and reporting applications, multidimensional analysis and planning applications.

Knowledge is defined as information combined with understanding, experience, accumulated,

learning and expertise relevant to a problem, decision or process. Knowledge is the fundamental objective of business intelligence.

The concept of BI is an “umbrella” concept for enterprise decision support systems that integrate the new information technologies (data warehouse, OLAP technology, data mining and Web). Also this paper discuss about the types of BI systems and the trends in BI.

14,45-15,00 **18. Developing E-Training Systems in Business,**

Authors:

Senior Lecturer **Adina Uta**, PhD, Academy of Economic Studies,
Bucharest, Romania;

19. Business Process Integration

15,00-15,15 **Authors:**

Lecturer **Carmen Timofte**, PhD, Academy of Economic Studies,
Bucharest, Romania,

Jack Timofte, OMV, Romania

Abstract

While business process reengineering (BPR) efforts of the 1990’s fell short of expectations, business process integration (BPI) has become a vehicle for achieving sustainable value for corporations. BPI projects help foster revenue growth, increase customer satisfaction, facilitate e-business deployment and meet cost reduction targets.

Business process integration and automation pick up where BPR left off. An extending process integration and automation solution beyond the enterprise delivers the efficiency that management has been seeking for decades. And e-business is the prime motivation for you to pursue these solutions now.

Critical Success Factors in a BPI Initiative

BPI delivers benefits by reaching beyond the traditional departmental retooling of processes found in BPR efforts to address a more comprehensive set of solutions. Specifically, BPI:

Enables functional integration across segregated business units.

Extends vertical process management into supply and distribution chains.

Provides companies with e-business integration capabilities.

BPI relies on certain critical success factors, the most important of which include:

Ensuring that BPI is a business-driven initiative.

Building a BPI coalition that crosses functional and enterprise boundaries.

Utilizing technology that facilitates BPI collaboration and deployment.

BPI Automation Requirements

BPI software should allow participants to collaborate with peers, management, subordinates, other business units, suppliers, distributors and customers via Web-based interfaces. To do this, BPI technology must incorporate certain functions to facilitate cross-functional projects.

- *Manual & Automated Process Integration* - BPI, by definition, must address the consolidation of redundant processes for both manual and automated processes. Many workflow products only address process integration within the context of one or more application systems. To be truly effective, a BPI product must extend to all manual and automated steps within the processes being integrated or the efficiencies companies are trying to gain will be lost. Along these same lines, BPI software must also manage business processes from end-to-end, allowing a series of processes to function in an uninterrupted fashion from the point where they are triggered to their natural conclusion.

- *Usability & Portability* - BPI technology should be transparent to business and third party users. This means that the triggering of a process, or response to a process-driven request, must be incorporated into a Web-based environment that is available to each user involved in that process. Given that HTML is the universal interface for users, process initiation, review and approval should show up as just another Web-based front-end to the average user.
- *Process Modeling* - Modeling third party and enterprise-wide process flows provides analysts with a comprehensive view of how processes need to be retooled, consolidated and automated. Modeling also provides management with the insights needed to eliminate processes and this serves to streamline user value. BPI software should be able to visually depict process flows as well as facilitate the reworking of those process flows during a given project.
- *Scale-ability* - BPI software must be highly scaleable. This means that a BPI product should accommodate a large number of internal and external processes, which include processes extending into supplier environments, distribution chains and customer domains. Scale-ability is measured in terms of the number of processes, concurrent users, locations, types of security clearances, environments, roles and organizations that can participate.
- *Analysis Capability* -BPI software should accommodate a dynamic level of responsiveness. In large, process-laden environments, a BPI product can meet this requirement by offering analytical tools to help business users identify bottlenecks, redundancies, waste, circuitous flows and other opportunities to streamline business processes on a rapid response basis.

The Importance of BPI Critical Success Factors

Before moving into any type of full scale deployment of a BPI project, those chartered with the success of that project must minimally consider the three critical success factors discussed here. A BPI coalition ensures that the right team is in place to define success criteria and measure project progress against those criteria.

A business-driven approach ensures that a BPI project is not too narrowly defined and does not take a technology oriented view. Having the right tools in place ensures that the project can actually be implemented on a scale that meets the business requirements of the coalition. Paying close attention to these critical success factors throughout a BPI project will ultimately deliver the promised benefits of BPI.

BPI projects facilitate e-business deployment and meet cost reduction targets.

20. Intrusion prevention systems

15,15-15,30 Authors:

Jack Timofte, OMV, Romania

Abstract

The Intrusion Prevention System has been considered as the next step in the evolution of the Intrusion Detection Systems. As opposed to the IDS, which monitors the network or host and is able to generate reports of possible attacks, the IPS plays an active role, being able to react in real time to prevent the attack from being successful.

The traditional form of protection, the firewall is not always effective against many intrusion attempts. The average firewall is designed to deny clearly suspicious traffic but will allow some traffic through. Many exploits are taking advantage of weaknesses in the protocols, which are allowed through the firewalls. Also the firewall is typically designed to protect the internal network from the outside. But according to various studies, a large percent of the attacks, intentional or unintentional are launched from within the organization, therefore the firewall cannot act under their circumstances. Intrusion detection systems provide detection of suspicious activity, but as seen in the case of worms like Slammer and Blaster, the propagation speed is very fast so that that by the time the alert is generated, the damage has already been done and the worm

widely propagated.

An IPS is a proactive defense system designed to analyze the traffic in real-time and be able to react and block the intrusion attempt before it has done any damage.

The two main types of IPS systems are Host IPS and Network IPS.

The Host IPS relies on agents installed directly on the system being protected. The agent is closely integrated with the operating system and intercepts all requests to that system, in order to be able to detect and prevent the attack. Therefore it must be very reliable, must not negatively impact performance, and must not block legitimate traffic.

The Network IPS combines the features of standard IDS, an IPS and a firewall. It is also known as In-line IDS. As with a typical firewall, the NIPS has at least two network interfaces, one designated as internal and one as external. Every packet passing is analyzed and the whole flow is marked as bad and discarded if an intrusion attempt is detected inside that packet flow. Legitimate packets are passed through the internal interfaces.

While the system looks promising, there are certain issues to be dealt with. Should a traditional IDS fail, the worst that could happen is that an attack may go undetected. The failure of an in-line IPS can seriously impact the network (create bottlenecks, deny legitimate traffic, performance issues). The “false positives” will always be an issue, when legitimate traffic looks like an intrusion attempt and the whole flow is discarded, thus generating a self-inflicted Denial of Service.

Vendors are already offering IPS products; ISS, NetScreen and Network Associates are just some of them. Despite their efforts, the deployment of such an IPS is a complex process, but the products are improving all the time and overall, the IPS looks like the best tool at the moment and is expected to be adopted by more and more organizations.

21. e-Business Technology

15,30-15,45 ***Authors:***

Lecturer **Carmen Timofte**, PhD, Academy of Economic Studies, Bucharest, Romania,

Abstract

The Internet has fundamentally altered the business landscape. No longer are organizations constrained by time or geographic location. Even the smallest business operator can function ubiquitously, reaching into time zones and destinations impossible to penetrate just a decade ago.

15,45-16,00 **23. *Traffic assignment models for the road networks. Application for the Bucharest Northern Bypass***

Authors:

Professor **Paun Mihai**, PhD, Academy of Economic Studies, Bucharest, Romania,

Student **Epuran Cecilia**, Academy of Economic Studies, Bucharest, Romania;

Abstract

This study deals with the traffic assignment analysis within a traffic study. Transport models are being used more frequently to assist in finding solutions to transport problems that are becoming more complicated as congestion grows. The most used model of a transport study covers four stages: the trip generation, trip distribution, modal choice and traffic assignment, each of these four stages being solved by a series of models. The traffic assignment models are used to estimate the flow of traffic on a network. These models take as input a matrix of flows that indicate the volume of traffic between origin and destination pairs. The flows for each O-D pair are loaded on the network based upon the travel time or impedance of the alternative paths that

would carry this traffic. This paper uses a simulation of the travel costs on the links of the road network that comprises the future Bucharest Northern Bypass. The travel costs also take into account the their different perceptions from the drivers. These different perceptions follow a normal distribution. The purpose of the paper is to forecast the future traffic flows on the Bucharest Northern Bypass.

15,30-15,45 24. *Modeling a public Key infrastructure*

Authors:

Professor **Paun Mihai**, PhD, Academy of Economic Studies, Bucharest, Romania,

Student **Opincariu Sorin**, Academy of Economic Studies, Bucharest, Romania;

Abstract

A global public key infrastructure is a prerequisite for implementation of security in the distributed systems and in the electronic commerce systems. In this paper we will consider an approach of modeling and reasoning about PKI from a user point of view. The user's view form which the user draws conclusions about the authenticity of other entities' public keys is made up of a series of statements about which public keys the user consider to be authentic and about which entities the user consider trustworthy. The model takes also into consideration recommendations for the trustworthiness of entities. In the last section of this paper I will describe how the PKI was set up for an Internet Banking service at HVB Bank Romania.

