IFIP: International Federation on Information Processing
TC8: Information Systems WG 8.9 Enterprise Information Systems
NJSZT: John von Neumann Computer Society
SEFBIS: Scientific and Educational Forum for Business Information Systems
SZE: Széchenyi István University

CONFENIS'2009

International Symposium
on Enterprise Information Systems

Hotel Famulus Conference Centre, Győr, Hungary
28th – 30th of October 2009.

HOSTING INSTITUTES AND SPONSORS

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TC8 Information Systems Technical Committee

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Welcome to CONFENIS'2009

The Enterprise Information Systems International Conference on Research and Practical Issues of EIS (CON-FENIS) is a primary international event of the IFIP (International Federation on Information Processing) TC8 (Technical Committee on Information Systems) Working Group 8.9 (Enterprise Information Systems). This program provides an opportunity both for academicians and practitioners throughout the world to gather, exchange ideas, and present original research papers in the field of enterprise information systems.

It is our great honour that the CONFENIS'2009 Conference sponsored mainly by the IFIP, TC8 and WG 8.9 has accepted the invitation of the John von Neumann Computer Society (NJSZT) and can be hosted and locally organized by the Szechenyi Istvan University (SZE) and the SEFBIS Community (Scientific and Educational Forum on Business information Systems).

The registered participants coming from altogether 20 different countries of the world represent every continents, with the topics of the papers the authors overview nearly all the interesting issues of the Enterprise information Systems. The 76 papers were reviewed by at least two reviewers; 61 were accepted for presenting and publishing, some of the authors of the accepted papers were asked to revise and modify their paper, and 15 papers were refused. By the decision of the Awarding Committee of the Conference three of the unambiguously "highly recommended" papers will be awarded at the Conference Closing Ceremony. The accepted papers are full of promise related to the audience's interest and we are fully convinced that the presentations will fulfill the expectations both of the participants and the sponsoring institutes.

On the occasion of organizing the CONFENIS'2009 in Hungary we published a **special edition of the SEFBIS Journal** with the papers of keynote speakers and some other excellent authors (all the conference participants get this special volume). The articles deal with different approaches of Enterprise Information Systems, so this volume provides comprehensive coverage of various ERP topics, and give a wide overview about the issues, results and even the problems of ERPs with reflections of internationally acknowledged scientists and experts in this field.

Concluding with my sincere greeting this International Conference I whish you to obtain new ideas, concepts, to gain new solutions and research results, to build new friendships in a truly European Spirit, and to enjoy your stay in Győr unforgettably!

Maria Raffai
IFIP Honorary Secretary elect; chair of SEFBIS NJSZT Community
Professor at Széchenyi István University
Győr, October 2009

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Conference Venue: Famulus Hotel and Conference Centre

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The Conference Program
General Overview

Conference Venue: Famulus Hotel and Conference Centre
Rooms: Budapest, Budapest A and B, Becs, Pozsony

	October 28. 2009 Wednesday Opening , Plenary	October 29. 2009 Thursday Parallel Sessions			October 30. 2009 Friday Parallel Sessions, Closing	
	10:00 Registration	R. Budapest-A	R. Budapest-B	Room Becs	R. Budapest-B	Room Becs
9:00 -						
-9:20		Session 2a.	Session 8a.	Session 11.	Session 6.	Session 3
-9:40		Analysis	Practical	ERP Solutions	Professionalism	Development
-10:00		and Modeling 1.	Issues of ERPs 1	OGIK track	Education	Technologies
-10:20						
10:40-		**Coffee Break**			**Coffee Break**	
11:10	**Business Meeting**				Session 12.	
-11:30	**Room Pozsony**	Session 2b.	Session 8b.	Session 10.	Social	
-11:50		Analysis	Practical	IT Security	Networking	
-12:10		and Modeling 2.	Issues of ERPs 2	Issues	(See the comment below)	
-12:30				OGIK track		
12:50-		**Lunch Break**			**13:00**	
14:00	**Opening Ceremony**				**Closing Ceremony, Awarding**	
	Room Budapest				**Room Budapest**	
14:00						
-14:20	**14:20 Plenary**	Session 5.	Session 8c.	Session 4.	**13:45- Lunch**	
-14:40		Effectiveness,	Practical	Knowledge		
-15:00		Competitiveness	Issues of ERPs 3	Management	**15:00**	
-15:20					**Evaluation Business Meeting**	
15:40-	**Coffee Break**	**Coffee Break**			IPC, WG 8.9 Evaluation Meeting Next CONFENIS Conference	
16:10	**Plenary Session**				**Room Pozsony**	
-16:30		Session 9	Session 7.	Session 1.		
-16:50		Strategy and	Social	Research,	**Comment to the Session 12:**	
-17:10		Services	Issues of ERPs	Results Theory	You are welcomed to bring your laptop or Internet enabled mobile	
-17:30					device, so that you can contribute	
19:00	**Reception**	**Gala Dinner**			and personally experience the effect of social networking.	
	in City Hall	**Hotel Konferencia**			WiFi is available.	

Opening Ceremony
Plenary Session with Keynote Speakers
28th of October 2009. Wednesday
Room: Budapest

Time	Program	Venue
From 10:00	**Registration**	**Hotel Aula**
14:00	**Opening Ceremony**	**Room Budapest**
	Welcome speeches of the Hosting Institutes:	
	Gabor Peceli (Hungary), president of the John von Neumann Computer Society	
	Basie von Solms (South Africa) President of IFIP (video)	
	Csaba Koren (Hungary), director of International Institute of the Széchenyi University	
	Li Da Xu (USA), A. Min Tjoa (Austria) chair/co-chair of WG 8.9	
	Peter Dobay (Hungary) co-chair of the Scientific and Educational Forum on BIS	
14:20 – 18:00	**Plenary Session**..	**Room Budapest**
14:20 – 15:00	Paul Hawkings et al. (Australia): Business Intelligence Maturity: An Evaluation of Australian Companies	
15:00 – 15:40	Gerhard Chroust (Austria): Software like an Understanding Friend – Challenges and Pitfalls of Localization	
15:40- 16:10	*Coffee Break*	
16:10 – 16:50	Radhika Santhanam et al. (USA): Improving the Success of Enterprise Information System Implementation – Current Findings and Future Research Directions	
16:50 – 18:00	Hughes Richard (United Kingdom): Enterprise Social Networking – Don't Be Afraid	
	Sandor Seres (Hungary): Enterprise Mobile Applications	
19:00	**Reception**	
	Venue: City Hall (see the map)	

Parallel Sessions
29th of October 2009. Thursday

Room: Budapest A

Time	Program

Session 2. Analysis and Modeling

Session Chair: GERGELY BABOS

9:00 – 9:20	Babos, G.: ERPs Elaboration and Utilization of Meta Data Mart by Using Oracle BIEE Reporting Tool
9:20 – 9:40	Čisar, P. et al.: Fuzzy EWMA Algorithm for Intrusion Detection
9:40 – 10:00	Kiss M. I. – Brachmann, F.: Using Data Warehousing Technologies in the Development of a Time Series Analysis Software
10:00 – 10:20	Medve, A. – Kovesi, K.: Modeling and Analysis of Information Security Starting from ISO/IEC 27001 Standard and Customer Loyalty Relationships
10:20 – 10:40	discussion
10:40- 11:10	*Coffee Break*

Session Chair: JOHANSSON BJÖRN

11:10 – 11:30	Johansson, B. et al.: Enabling Long Term Synchronization of ERPs and Businesses through Enterprise Architectures
11:30 – 11:50	Molnar, B. – Ko, A.: Applying Neural Networks for eGovernment Projects' Goal Indicators Analysis
11:50 – 12:10	Brachmann, F. – Farkas, Sz.: Creating a Framework for Supporting the Rapid Development of GPS-enabled Location-based Services for Multiple Mobile Platforms
12:10 – 12:30	Tarcsi, A.: Enterprise 2.0 Web-Application Models
12:30 – 12:50	discussion
12:40- 14:00	*Lunch Break*

Session 5. Effectiveness, competitiveness

Session Chair: MIKLOS HERDON

14:00 – 14:20	Herdon, M. – Rozsa, T.: ERP-ECO Model System for Economic Evaluation of ERP and its Application in SMEs
14:20 – 14:40	Simkova, E. – Basl, J.: Innovation of Enterprise Information Systems with Contribution of the INNO IT Framework
14:40 – 15:00	Feher, P.: The Challenge of IT in Downturn
15:00 – 15:20	Erdos, F.: Sophisticated Methods to Calculate the Benefit of IT Investments
15:20 – 15:40	discussion
15:40- 16:10	*Coffee Break*

Session 9.   Strategy and Services

Session Chair: PETR DOUČEK

16:10 – 16:30	Douček, P. – Novotny, O: Human Resources in ICT – The Czech Republic Analysis
16:30 – 16:50	Tonelli, A. et al.: Information Technology Strategic Planning with Emphasis on Knowledge
16:50 – 17:10	Micsik, A. – Karaenke, P.: Agent-Supported Service Management and Monitoring for Flexible Inter-Enterprise Cooperation
17:10 – 17:30	Monteiro da Silva, H.A. et al.: Strategy Focused Information System Design and Analysis: a Case Study for Bueno Netto Construction Company
17:30 – 17:50	discussion

Room: Budapest B

Time	Program

Session 8.   Practical Issues of ERP Systems

Session Chair: V. BALAKRISHNAN

9:00 – 9:20	Balakrishnan, V. – Das, A.: Analysis of Critical Problems in ERP Implementation to Enhance Service Oriented Architecture for Energy & Utilities – A Case Study
9:20 – 9:40	Herdon, M. et al.: ERPs in Digital Business Ecosystem
9:40 – 10:00	Mehmood, Y. – Majeed, A.: Incorporating Business Process Change in Information System Design
10:00 – 10:20	Moller, Ch.: Decoupling the IT Value-Chain: The Role of Enterprise Systems in Managing Business Processes
10:20 – 10:40	discussion
10:40- 11:10	*Coffee Break*

Session Chair: CARVALHO ROGERIO

11:10 – 11:30	Atem de Carvalho, R. – Monnerat, R.M.: Using Design Patterns for Creating Highly Flexible ERP Systems
11:30 – 11:50	Petkovič, I. – Petkovič, A.:The Application of Dashboards and Scorecards for Visualization of Reports and CRM Indicators in the Electric Power System
11:50 – 12:10	Szabo, Z. – Feher, P.: Current Challenges of IT Service Management in Hungary
12:10 – 12:30	Nemeth, M.: BX Test Script Executor for SAP Business One
12:30 – 12:50	discussion
12:40- 14:00	*Lunch Break*

Session Chair: ANDREW STEIN

14:00 – 14:20	Stein, A. – Hawking, P.: Merging Corporate Enterprise Systems
14:20 – 14:40	Končar, J. et al.: Globalization and Electronic Commerce Development in the Republic of Serbia
14:40 – 15:00	Zhang, Li. – Johansson, B.: A Study of Chinese Governments Informatization
15:00 – 15:20	Wang, H.: Theory and Applicant of On-line Rental of EIS for SMEs in China Based on Minimum Social Cost
15:20 – 15:40	Khoo, B.: Information Security Governance of EIS: A United States Perspective
15:40- 16:10	*Coffee Break*

Session 7.   Social Issues of ERPs

Session Chair: GABOR HOMONNAY

16:10 – 16:30	Homonnay, G.: The Twilight of the ERPs?
16:30 – 16:50	Uchiki, T.: The Characteristics of Researches of Enterprise Information Systems in the Social Context of Japan
16:50 – 17:10	Nemeslaki, A. – Bielli, P.: Existing Business Challenges of Information Communication Technologies
17:10 – 17:30	Kovesi, K. – Habbouche, F.: How Embodied Conversational Agents (ECA) affect Customer Trust in a Service Enviroment?
17:30 – 17:50	discussion

Room Bécs

Time	Program

Session 11. ERP Solution (OGIK track, presentations in Hungarian)

Session Chair: ERZSEBET NOSZKAY

9:00 – 9:20	Rózsa, T.: Disztribútorok és ERP rendszerek összehasonlító elemzését támogató modell
9:20 – 9:40	Szabó, Gy.: ERP rendszerek a gyakorlatban; haza,i nemzetközi megvalósítások elemzése
9:40 – 10:00	Pödör, Z.: Az adatbányászat alkalmazási lehetőségei az erdészet területén
10:00 – 10:20	Vigh, Gy.: Webes alkalmazások akadálymentesítése – az e-learning szemszögéből
10:20 – 10:40	Láng, B.: Hibrid eljárás a diszkont pénzáramos erőforrás-korlátos projekt ütemezési probléma megoldásához

10:40- 11:10	*Coffee Break*

Session 10. IT Security Issues (OGIK track, presentations in Hungarian)

Session Chair: JANOS KOVACS

11:10 – 11:30	Nemeslaki, A.: Kritikus kérdések és problémakörök az e-business témakörében
11:30 – 11:50	Éltes, Z. – Medve, A. – Kövesi, K.: Az elektronikus kereskedelmi rendszer biztonsága
11:50 – 12:10	Kövesi, K. et al.: e-szolgáltatások és ERP-rendszerek integrált módú információbiztonsága
12:10 – 12:30	Spilák, V. – Kosztyán, Zs.T.: Információbiztonság mint a modern társadalom kihívása
12:30 – 12:50	Hegedűs, Cs.: A mérési bizonytalanság figyelembe vétele gyártásirányító rendszereknél

12:40- 14:00	*Lunch Break*

Session 4. Knowledge Management

Session Chair: JONES JAMES D.

14:00 – 14:20	Jones, J.D. – Badiola, S. – Xu, L.: Things to Think About, When Thinking of About Enterprise-Wide Information: Knowledge Representation Issues
14:20 – 14:40	Kristof, P.: The Three-dimensional System of Knowledge, Innovation and Controlling and the Role of IT-framework
14:40 – 15:00	Bošnjak, S. and Z. – Grljavić, O.: Knowledge Discovery Improvement by Utilization of Diversified Data Analysis Tools
15:00 – 15:20	Micsik, A. et al.: A Use Case of Service -based KM for Software Development
15:20 – 15:40	discussion

15:40- 16:10	*Coffee Break*

Session 1. Research Results, Theory

Session Chair: JAN PRIES HEJE

16:10 – 16:30	Svejvig, P. – Pries-Heje, J.: Enterprise Information Systems Outsourcing: A Look Behind the Curtain
16:30 – 16:50	Atem de Carvalho, R. et al.: Mapping Agile Methods to ERP: Directions and Limitations
16:50 – 17:10	Mehmood, Y. – Farooq, A. – Younus, J: Efficient Metadata Loading for Generation and Parsing of Messages in Health Level 7 Compliant Enterprise Solutions
17:10 – 17:30	Silva, J.L.et al: The Compiler to Convert C into a Dataflow Graph to be Executed into the ChipCflow, a Dynamic Dataflow Machine
17:30 – 17:50	discussion

19:00	**Gala Dinner**
	Venue: Hotel Konferencia (Apor Vilmos Tere on the Hill, see the map)

Parallel Sessions
30th of October 2009. Friday

Time	Program

Session 6.	**IT Professionalism, Education** .... **Room Bécs**

Session Chair: ANDREA KO

9:00 – 9:20	Ko, A. et al.: STUDIO - Ontology Driven Learning Environment
9:20 – 9:40	Noszkay, E. – Balogh, A.: Correspondence System of Lifelong Learning, Knowledge Management and E-learning in Everyday Higher Education Practice
9:40 – 10:00	Bako, M. – Lengyel, P.: Comparison of the French and Hungarian Distance Learning Systems of Agro-economical Studies
10:00 – 10:20	Krankovits, M. – Csik, A.: Intelligent Knowledge Assessment in eLearning
10:20 – 10:40	discussion

10:40- 11:10	*Coffee Break*

Session 3.	**Development Technologies** .... **Room Budapest B**

Session Chair: Abreu Fabio Pinherio

9:00 – 9:20	Abreu, F.P et al. : A Process to Monitor the Software Acquisition Based on Verification and Validation
9:20 – 9:40	Pries-Heje, L.: Re-conceptualizing ERP Implementation as an Articulation Process
9:40 – 10:00	Kiss, J. – Kosztyan, Zs.T.: Handling the Specialties of Agile IT Projects with a New Planning Method
10:00 – 10:20	Li, M. – Quin, X.: A Parameter Optimal Deployment Method for Product Development
10:20 – 10:40	discussion

10:40- 11:10	*Coffee Break*

Session 12. Social Networking ....**Room Budapest B**

11:10 – 12:10

Session Chair: Mɪᴋʟóꜱ Bíʀó
Biro, M.: Business Drivers and Challenges of Cloud Computing and Social Networking
Application Development

The participants are welcomed to bring their laptop or Internet enabled mobile device, so
that they can contribute and effect of social networking. personally experience. WiFi and
cable network is available.

12:10 – 12:30   discussion

Closing Ceremony

Time	Program
13:00	**Closing Ceremony, Awarding** ....**Room Budapest**

Evaluation of the TC8 Committee and the WG 8.9 Working Group chairs
Awarding of the three besp papers – Trophy and diploma
Change-over from Confenis'2009 to Confenis'2010: Conference trophy and stamp of WG
8.9 (Maria Raffai – Rogerio Atem de Carvalho)
Acknowledgment: Maria Raffai General Chair of IPC

Official closing

13:45	*Lunch*

15:00   **WG 8.9 Evaluation meeting, next conference**..**Room Pozsony**

Plenary Session
Enterprise Information Systems:
Theoretical and Ethical Approaches, Practical Issues

Session Chair: Peter Dobay

Business Intelligence Maturity: An Evaluation of Australian Companies

Paul Hawking[1] – Robert Jovanovic[1] – Carmine Sellitto[1] – Susan Foster[2]

[1]School Management and Information Systems Institute of Logistics and Supply Management, Victoria University, Melbourne, Australia; eMail: Paul.Hawking@vu.edu.au
[2]School Management and Information Systems, Monash University Melbourne, Australia

Effective business intelligence (BI) is essential for companies in today's business environment. However companies utilising BI in a variety of ways to maximise its potential. Authors have developed maturity models to map BI usage and potential. This research evaluates the applicability of different BI maturity models to Australian companies.

Companies today have all come to realise the importance of providing accurate, relevant and timely information— information that allows their organisational personnel to engage in effective decision-making practices. Aristotle Onassis, the famous Greek shipping tycoon once commented that "the secret of business is to know something that nobody else knows" in their paper on Information Economics stated that "… information is the glue that holds business together". Clearly, the consequences of treating information as a strategic resource and corporate investment can result in companies gaining industry-wide advantages that are reflected through increased reputation and profitability.

Companies have developed and implemented systems to facilitate the collection, processing and dissemination of information. One such system, Enterprise Resource Planning (ERP) system, has enabled companies to gain efficiencies in their business processes and associated transactions through the high degree of integration of their company-wide business processes and associated data. ERP systems are an essential element of the corporate information systems infrastructure allowing a business to be competitive in today's world, as well as providing foundation for future growth. A survey of 800 top US companies showed that ERP systems accounted for 43% of their information technology budgets. The ARC Advisory Group (2006) estimated that the worldwide market for ERP systems was $USD16.67 billion in 2005 and is forecasted to surpass $USD21 billion in 2010.

Accenture interviewed 163 executives from large enterprises around the world to identify how companies were using ERP systems to improve business performance and the specific practices that resulted in sustained value creation. They found that the implementation of an enterprise-wide information system resulted in sustained value creation however; some corporations realized far more comparable benefits than others. A more extensive follow up study in 2006 involving 450 executives from 370 companies identified the factors that drove value from their ERP system, as well how companies used these systems to enhance competitiveness and differentiation. One of the key findings from this study was that improved decision making was the most sought out and realized benefit. Related to this finding was that the top performing companies aggressively used information and analytics to improve decision making. These findings are supported by Gartner, a leading business analyst firm, who conducted a worldwide survey of 1,500 Chief Information Officers and identified Business Intelligence (BI) as the number one technology priority for companies, second to ERP systems. In a Cutter Consortium Report (2003), a survey of 142 companies found that 70% of the respondents had implemented data warehousing and BI initiatives. This is reflected in the forecasted BI vendor revenue expected to be $7.7 billion by 2012.

This increased expenditure on BI reflects the level of impact these systems can have on a company's performance. IDC, another technology analyst firm, found in a survey of 62 companies that there was an average a 401 percent ROI over a three year period (IDC, 1996). The Data Warehousing Institute (identified that the use of BI in a number of organisations such as Hewlett Packard and the US Army had a significantly positive impact on their performance. Hewlett Packard found in 2004 that due to their BI initiative, the value of worker productivity increased by approximately USD$10.6 million, whilst the company's reporting costs

being reduced by some $8.6million. The US Army NGIC found that as a result of their BI implementation, 10 trained analysts could complete as much work as 200 traditional analysts. In another example of the value of BI, Harrah's, a major hotel and casino owner in America, believe that BI contributed to their improvement in performance and $235 million profit in 2002. Harrah's spent $10million to build a 30 terabyte data warehouse and used BI to better understand their customers and their gambling habits. The IDC group collected data from forty three companies in North America and Europe that had implemented a BI and found that twenty companies achieved a ROI of less than 100 percent; fifteen achieved an ROI between 101 and 1000 percent, whilst eight achieved an ROI greater than 1000 percent.

Paul Hawking is one of the leading commentators on ERP systems and specifically SAP solutions. His knowledge is well respected in both industry and academia and accordingly is often required to assist companies with their ERP strategies. He is a senior lecturer at the Victoria University School of Management and Information Systems, and SAP academic program director. He has been a committee member of the SAP Australian User Group for the past six years and is responsible for knowledge transfer. He graduated Diploma of Business Information Technology (Swinburne Institute of Technology, 1992), Master of Business Computing (Victoria University, 1996), and he has doctorate degree in Business Administration (Victoria University). Paul Hawking is one Australia's best selling IT authors having written 10 books that are sold throughout the world. His areas of teaching and research are ERP systems strategy and implementation, and Business Intelligence.

Software like an Understanding Friend
Challenges and Pitfalls of Localization

Gerhard Chroust

Johannes Kepler University Linz, Austria; eMail: gc@sea.uni-linz.ac.at

The ubiquity of Information and Communications Technologies requires software products to be offered on a global scale. As a consequence software providers have to market and sell software products in many different countries, bringing different people into direct (often unexpected) contact with computerized interfaces. Potential customers expect the software product not only 'to speak their language' but also to show a pattern of behaviour which is compatible with their cultural expectations and predispositions. They expect reactions from a software product in the manner of an "understanding, well-meaning friend". This involves a great deal more than a pure language translation: it implies the transfer of the software product into a different cultural environment taking into account all aspects of cultural divergence. We speak of *localization*.

Motivation

Today practically every product showing a minimal sophistication contains large amounts of software: we call them *software-intensive systems*. They are systems where software provides an integral and essential part of functionality without necessarily being noticed from the outside. Today an ever increasing number of people use such software- intensive products, often without the necessary pre-knowledge about software, also not in- tending to get acquainted with the "computer's way of thinking". These users only want to perform their job or assignment with the help of the new tools. Today the world is interconnected by global networks offering seamlessness connection (for example e-mail, World Wide Web, e-commerce, etc.) to the electronic world everywhere. At the same time Information and Communication Technology allows an almost cost-free access to and distribution of software products worldwide. For reasons of economy software products have to be marketed and sold world-wide.

Technological progress allows communication not only via text (as 25 years ago) but also via pictures and displays providing a colourful, animated images showing people in their traditional surroundings, utilizing software products as part of our daily environment. These products execute more complex tasks in closer imitation of human behaviour than ever. Thus people often forget that their 'communication partner' on the other side of the computer interface (which does not look like a computer interface!) is not a human but a machine. The misinterpretation of a socially well-designed computer interface was dramatically shown back in 1966 by Joseph Weizenbaum's famous 'Eliza-Experiment'. Users expect the software product not only 'to speak their language' but also to show a behavioural pattern which is compatible with their cultural expectations and preconditions, this means a certain adherence to conventions and behaviour. As a consequence humans tend to ascribe human qualities to complex sophisticated computer interfaces. When software is used in an assisting way people tend to expect reactions from software product like an "understanding, well-meaning friend" or as stated in [Miller-04] "good behaviour, etc., ... with the sensitivity of an intuitive, courteous butler".

This means that the software product has to behave in accordance with the expectations in- duced by the environment. In a face-to-face conversation the (geographic) context is obvious to all partners. A conversation in a pub carries another connotation than a formal meeting with the boss in his office!

For an (acoustic) tele-conversation this context is almost completely eliminated. As long as the interface is pure text, many human communication channels and context indicators are missing. Nowadays technology makes it possible to supplement the spoken word not only with written text but also with images of the context (most mobile phones have this option!). A communication with a software product is often augmented by visual environmental context, including moving generated characters (avatars) showing unavoidable some kind of body language. Without appropriate localization this easily leads to misunderstanding, embarrassment and ridicule.

The situation is even aggravated by the fact that many people interact with computer inter- faces from their home (e.g buying via e-commerce etc.). While a sterile office atmosphere might make people less aware of a cultural match on the other side - being at home makes such discrepancies even more noticeable. An added difficulty is that larger and larger sectors of the population have to get into contact with computerized interfaces (cf. e-government). An increasing percentage of users is not willing, interested or able to communicate in a foreign language with the system. They expect high-quality communication in their mother tongue compatible with their cultural expectations. All these considerations make it necessary to explicitly *transfer* a software product into a geographically (and culturally!) different environment. This implies much more than a sim- ple language translation: We speak of *localization*, i.e. *the process of adapting a product to reflect the local standards, culture and language of another market*, or *the infusion of a specific culture into an international product*.

"Culture" is very difficult to define, at best we can say that culture is a shared complex system of language, value system, norms, religion, myths, beliefs, manners, behaviour, and structure which is characteristic of a society or part of it. Cultural incompatibilities start with minor nuisances as every tourist to a foreign country might notice, e.g. indicating numbers on your fingers up to cultural clashes as exemplified the uproar in 2005 about the Danish cartoons about the prophet Mohammed → *Even worse, if you advertise a holiday resort and you show (as is the habit in Europe) scantily clad women in bikinis, disco dancing and drinking at the bar you will create considerable objections in Muslim countries, but the internet does not allow you to limit the geographic coverage of your advertisement (in contrast to regular mail!).*

In the paper we identify seven localization layers of increasing cultural sensitivity and dependency, from infrastructural to social issues. We discuss their interdependence and issues of technical implementation. Additionally we introduce examples of problems, pitfalls and embarrassments.

Keywords: layers of localization, national differences, cultural diversity, national languages

Gerhard Chroust joined the IBM Laboratory Vienna in 1966, were he worked on the Formal Definition of PL/I (1967/68), on compiler construction, on a PL/I Compiler for the IBM 8100. 1983-90 he was member of the development team for ADPS (Application Development Project Support), responsible for defining the Process Model. From 1992 to 2007 he was full Professor of Systems Engineering at the Kepler University Linz, Austria, initially at the Institute for Systems Sciences and then head of the Institute of Systems Engineering and Automation. Since 2007 he is professor emeritus. He is Secretary General of the International Federation of Systems Research (IFSR), a former president of the Austrian Society of Informatics and vice-president of the Austrian Society for Cybernetic Studies. Current research and teaching interests are focused on description, implementation and certification of socio-technical systems and on the enactment and support of the necessary development processes. Further research is devoted to cultural differences and human factors in system development, to system research and to component bases software development.

Improving the Success of Enterprise Information System Implementation Current Findings and Future Research Directions

[1]Radhika Santhanam – [2]Sharath Sasidharan – [3]Priyanka Meharia – [4]Dan Brass – [5]V. Sambamurthy

[1,3,4]University of Kentucky, [2]Emporia State University, University [5]Michigan State University,
eMails: [1]Santhan@uky.edu, [2]ssidha@emporia.edu, [3]Priyanka.Meharia@uky.edu, [4]dbrass@uky.edu, [5]sambamurthy@bus.msu.edu

Enterprise Information Systems, the predominant form of systems adopted by organizations today, have yielded mixed and unpredictable implementation outcomes, making it a risky investment. To identify factors that can facilitate success, we first conducted a survey of existing research. We found that existing research had not focused on understanding post implementation issues particularly how users learn and assimilate a system. We felt that social learning among employees will play a critical role. We posited that social network characteristics of employees affect post adoption information exchanges, and influence the extent of implementation success. We conducted a three-phase longitudinal one year study of the effects of social network structure on the implementation success of an EIS. We found that employees' social relationships including their access to the help-desk had an impact on implementation success. We discuss some preliminary findings here.

Many large organizations have integrated EnterpriseInformation Systems (EIS) and it is estimated that over 80 percent of Fortune 500 companies have installed these as the information system of choice. EIS attempt to integrate information across departmental and functional units within an organization by implementing an integrated software program with a unified database. Examples include Materials Requirements Planning (MRP) systems, Airline Reservation Systems, Inter-Organizational Information Systems Enterprise Resource Planning systems.

Enterprise Resource Planning Systems (ERP) are among the most popular of EIS and are implemented using software such as SAP, PeopleSoft, etc. to replace disparate smaller systems, It is adopted in order to streamline operational processes, have a smooth and coordinated data collection and information delivery method to support decision makers spread across distant units of the organization. ERP been described as the "seamless integration of processes across functional areas with improved workflow, standardization of various business practices, improved order management, accurate accounting of inventory and better supply chain management. These systems have been rapidly growing in its deployment, and as per a recent report, ERP vendor revenues is expected to grow to 50 billion dollars by 2011. It is no wonder then that practicing business persons, academics and technology specialists are very interested in understanding these systems and ensure their successful implementation.

The rise of ERP type systems started in the early 1990's, with Material Requirements Planning (MRP); Manufacturing Resource Planning (MRPII); and Computer Integrated Manufacturing (CIM) with all software applications supporting the automation of various aspects of a manufacturing enterprise (. Application software was developed to support the financial transactions, such as payroll, general ledger, and billing was developed which later came to be known as the "R/2 system" where "R" stands for real-time data processing and 2 represented the two tier architecture of the IBM mainframe computers "Enterprise Systems" or ERP today have expanded their reach to offer products for customer relationship management, product lifecycle management, strategic enterprise management, business warehouse, business intelligence tools, and supplier relationship management. While the growth rate of ERP adoption in large scale organizations may not be as spectacular as it was a few years ago, they are still being implemented in many large and increasingly in small and medium size organizations and even non-profit institutions such as Universities and Federal Governmental agencies. From a vendor perspective, as per surveys by AMR Research, there has been consolidation in the industry with the major vendors such as SAP, Oracle, Sage, Microsoft and others accounting for over 70% of revenues and projected to grow. The midrange and small range markets continue to grow, and some clients have opted to buy functional modules in an incremental manner rather than make a big purchase upfront. Furthermore, in the globalized world other variations of EIS, such as supply chain management systems, collaborative systems and e-logistics systems are being implemented. Hence, understanding the most effective ways to implement EIS systems is of utmost importance.

Radhika Santhanam is a Gatton Endowed Research Professor in the Gatton College of Business & Economics, at the University of Kentucky. She has conducted extensive research to understand and enhance user learning of new information technologies. Recently, along with her doctoral students and colleagues, she has conducted several longitudinal studies on Enterprise Information Systems, and proposed training and learning approaches that can facilitate their successful implementation. Findings from her research have been published in leading information system journals such as, *MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, *Information and Organization*, *Decision Support Systems*, *and European Journal of Information Systems*, among others. She is an Associate Editor at *Information Systems Research* and *Decision Support Systems*, and on the editorial board of *Enterprise Information Systems*. Earlier, she was an Associate editor at *Management Information Systems Quarterly* and *Computer and Operations Research*. She was the Program Co-chair for the 2005 Annual Conference of the Association of Information Systems

Enterprise Social Networking – Don't Be Afraid

Richard Hughes

BroadVision Inc, eMail: Richard.Hughes@BroadVision.com

If Facebook were a country, it would now have the 3rd largest population in world; only China and India are bigger. It has recently passed the 300 million user mark, meaning that there are as many people registered on Facebook as there are citizens of the United States. While it is only the fourth largest web site in the world in terms of unique visitors, it beats the top three by a long distance in terms of time spent on the site.

So it is hardly surprising that many businesses are concerned about the potential productivity loss and impact to their brand image that this brings with it. Nucleus Research found that nearly half of office employees access Facebook during work and that companies effectively lose an average of 1.5% of total office productivity when employees can access Facebook during the work day. Proofpoint found that 8% of companies reported that they have dismissed employees because of their behaviour on sites like Facebook and LinkedIn, double the number from a year ago. But it would be a mistake to make a knee-jerk dismissal of the potential of social networking for businesses based on these figures. Used well, social networking has significant productivity benefits for the enterprise.

First, we must separate two related, but distinct areas. "Enterprise Social Media" can be considered to be the way in which businesses use established consumer-oriented social networks as marketing channels. For example, Facebook fan pages, announcements via Twitter and promotional videos on YouTube. Then there is "Enterprise Social Networking" which concerns how social networking techniques and technologies can be applied in a business context. It is this area that we will consider here. An Enterprise Social Network (ESN) typically consists of the following components:

– Blogging: personal commentary and opinion articles
– Micro-blogging: Twitter-style short updates describing what people are currently doing
– Discussion forums
– Wikis: community-edited repositories of knowledge
– Document/media sharing
– Relationship maps: details of professional relationships between members of the network

There is perhaps a danger in using the word "social" here. An ESN is not intended to use these technologies simply for socializing between employees and commenting on each others' family photos. Instead, they are applied to a business context. For example:

– Enabling a customer support team to interact more directly with it's customers to gain a greater understanding of customer opinions and requirements.
– Enabling a sales team to work together on a complex business proposal.
– Establishing a focal point for distributed employees in a global company to come together to discuss ideas and innovations.
– Building a corporate culture and sense of community within a company.

While consumer-focused tools like Facebook, Twitter, and even business-oriented services liked LinkedIn have established a familiarity and desire for employees to use social networking techniques, they are not suitable for these types of applications. Instead, a new category of Enterprise Social Networking application suites is emerging. Will these applications replace existing enterprise portals? That depends a lot on the nature of the existing portal. The word "portal" has become so overused that it often means little more than "web site". Probably the best and most complete definition of the different types of portals comes from Gartner, who define five generations of portal technologies.

- Generation one (1998 to 2000) — Content and basic portal capabilities, including personalization and the portlet model
- Generation two (2000 to mid-2002) — Application integration
- Generation three (mid-2002 to 2003) — Process integration and basic Web services support
- Generation four (2004 to mid-2005) — Portal federation, portlet standards and composite applications
- Generation five (mid-2005 to 2008) — SOA and user experience management

Gartner have now started defining the sixth generation of portals, which includes the application of Web 2.0 techniques such as mash-ups, user-generated content and social networking to portals.

So is it just a question of sitting and waiting for the "generation 6" release from your portal vendor to turn your portal into a social network? That is one option, but it may be a long wait, and the result may not be all you hope for. The fundamental basis of portal applications which have evolved in line with the Gartner definition is a content- and process-centric information architecture. Social networks, in contrast, are people-centric, with priority given to the relationships between users on the site rather than a rigid information structure.

Yet few businesses will have the appetite to discard their existing portal investments and start again, restructuring their content and processes in a more people-centric way. Yes, small, departmental intranets and others which have not progressed beyond generation one may be straightforward to migrate in this way, but for larger enterprise portals it would be hard to justify the cost and disruption of this. Therefore, the most prudent strategy is coexistence of ESNs alongside enterprise portals. The focus of the ESN is not the content itself, but the discussion and collaboration around that content. Whether the content is hosted on the portal or the ESN really doesn't matter. To take a consumer-oriented analogy, it is just as easy to use Facebook to discuss a photo hosted on Flickr as it is a photo that was uploaded directly to Facebook. Indeed, it may be preferable for the photo to be on Flickr to enable it's use in other web services. Similarly, content on an enterprise portal may need to be accessed from both the ESN and other web sites, for example, an eCommerce system.

While this means that some integration is required, the good news is that the technologies and interfaces to enable it are widely deployed in portals already. For example, RSS and Atom for content syndication and LDAP for single sign-on. So, despite the horror stories about businesses and social media, social networking has the potential to bring many benefits to the enterprise. Yes, employee use of consumer social networks needs to be managed carefully. But enterprise social networking should be seen as an opportunity, not a threat, which can coexist and complement existing portal investments.[1]

Richard Hughes is Technical Director at BroadVision, a global provider of personalized self-service web applications. As a senior technical expert of BroadVision, Mr Hughes is integral guiding product development as well as the strategic success of customers of BroadVision . During his 11 years at BroadVision, Richard has advised major international companies such as British Telecom, O2, Vodafone, DSG, ABN AMRO and Ericsson on deployment of their eCommerce and enterprise portal systems. latest solution of BroadVision is Clearvale, an Enterprise Social Networking suite. Prior to joining BroadVision, Mr Hughes managed the eCommerce web site at Blackwell Online Bookshop. He has a BSc in Computer Software Technology from the University of Bath

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[1] There is a great opportunity to obtain experiences in social networking and to get practice in it (Session 12, Room: Budapest B). Please visit the performance of Miklos Biro in the Friday morning 30th of October 2009! (editor's comment)

Enterprise Mobile Applications

Sandor Seres

CoDe Ltd, sseres@code.hu

The mobile phone is one of the most widely used devices: there are at least 3 times more mobile phone is used then PC. In the developed part of the world most of (if not all) person has mobile phone, while in the developing part some times the mobile phone is the only device connecting peoples. The extensive use of phones and its personal nature enables information/application providers to provide a „personalized" information delivery to clients or employees. Here we analyze how mobile phones can be used for enterprise applications, and what are the challenges.

Why users are using mobile applications? In order to design enterprise mobile application strategy, we should verify what the need of mobile services is: why users are using mobile services and in which situation. The typical drive to use mobile phone to get or submit information is
  – time
  – place
  – personal information

Of course there is difference in the consumer market and in the business sector. In the consumer market two demands can be seen
  – specific, personalized information is needed right now and anywhere
  – time to kill (play your favorite game while waiting for something, or listen a music)

In the enterprise market it is different:
  – improve communication between offices and field representatives
  – ability to lower costs, improve business processes, and increase efficiency

Few years ago even sending bulk SMSes to the sales force was considered to be an enterprise mobile application, then it has evolved to provide company mail access. This is now provided by almost all enterprise. Nowadays VoIP is getting its acceptance for internal communication or conferencing. Other possible applications:
  – Customer relationship management (CRM mobile self service),
  – Human resource management systems (staff scheduling),
  – Point of sale (POS),
  – Supply chain management,
      • sales order, purchase order,
      • shipment, receiving, warehousing, inventory control, delivery order
      • production monitoring and control
  – Enterprise resource planning (ERP)
      • corporate calendar,
      • corporate address book,
      • corporate bulletin board,
      • notes and internal messaging

Enterprise Mobile applications are difficult to create. Before someone is starting to develop a mobile application to enterprise market there is lots of business and technical issues to consider. For example there is difference in intra enterprise applications and in the application what an enterprise use in the client communication.

With the history of more than a decade, SMS is widely used, but only text messages can be delivered. The WAP or Browser based applications using mobile data connection (GPRS/3G) can provide more

interactive features, but the complex configuration of the network and the cost of data access, especially in roaming environments limit its usage. Native application development would limit the number of usable phone types, and can be used only in internal projects where the phone types can be defined. With the number of smart phones enabling J2ME based applications brings hope, but the compatibilities what these phones provides is limited, plus the deployment of applications are quite difficult for a normal phone users. SIM card based java applications extensively used by the operators for client communication, but the complexity, and the cost of development, deployment is exclude this type from solutions for an enterprise. As a new tool, Adobe provides Flash Lite to phones, but vendors do not deliver handsets with the latest version, so it should be installed by the user or does not even support it (like iPhone.)

Design consideration

Overall user experience remains one of the most important factors. Application provisioning is the first critical part of any mobile application. This is when the customer first meets with the application. Application providers need to offer application that is easy to access and quick and reliable to download.

Mobile phones are typically delivered by mobile operators. Operators have all the infrastructure and business support system to keep track of the client phone type, to do the provisioning of the correct version of the requested application. Enterprise typically has no such system to support these needs. This should be provided as part of the solution! This type of Mobile Application Delivery platforms should take care of
  – handset identification
  – application personalization
  – data security
  – OTA provisioning
  – integration to the enterprise existing application

Client side design is also on top of the design consideration list. Many developers try to use the same techniques, interfaces, and designs what they use in a web application, but this is away to failure. The handset has a limited screen size and a special keyboard. All the time it should be considered the "Distance from the information". Distance is defined as the number of action (key press) the customer needs to do to access the content. This would point to a design decision where information can be stored or cached on the handset. (for example installed java base solution or the use of local storage (SQLite) in iPhone)

Client-Server communication is also an issue. Nowadays on the web it is typical to use web services, SOAP or XML-RPC (HTTP protocol and XML data encoding) for such communication. Implementing an XML encoding/decoding using limited memory is possible, but not the best strategy. Typical mobile client is using JSON-RPC 2.0 more likely as it is easy to implement, smaller foot print and can also be used in XHTML/JavaScript version. The presentation will try to advice on technology to use and try to give useful design tricks.

Sandor Seres is Technical Director at *CoDe*, a global provider of Enterprise Mobile Applications. He has Msc. in Engineering from the Technical University in Budapest and BSc in Applied Mathematics from the Technical University of Budapest. Sandor has more than 15 years of experience in implementing IT solutions at customers around the world. (35+ countries) This includes all aspects of solution design, system integration e.g. customer interaction, business/requirements specifications, definitions of service offerings, selling of systems and services, management of system integration projects, turn-key solutions etc.

SESSION 1
RESEARCH RESULTS, THEORY

Session Chair: Jan Pries-Heje

Enterprise Information Systems Outsourcing: A Look Behind the Curtain

Per Svejvig[1] – Jan Pries-Heje[2]

[1]Aarhus Business School, Denmark, PSVE@asb.dk   [2]Roskilde University, Denmark, janph@ruc.dk

Outsourcing is now a feasible mean for Enterprise Information Systems (EIS) cost savings, but do however increase the complexity substantially when many organizations are involved. We set out to study EIS outsourcing with many interorganizational partners in a large Scandinavian high-tech organization SCANDI, trying to answer the question: Why does SCANDI engage in very complex EIS outsourcing arrangements? To answer this question we observed numerous meetings and collected data from interviews in four parts of SCANDI. After transcribing and analyzing our data we found at first just the rational cost saving explanation; but then with a more careful analysis focusing on institutional factors, other explanations "behind the curtain" were revealed, such as management consultants with a "best practice" agenda, people promoting outsourcing thereby being promoted themselves, and outside training leading to a belief in outsourcing as a "silver bullet" solving everything.

Enterprise Information Systems (EIS) is a technology that provides an organization the possibility of integrating and coordinating business processes. An EIS is one single (big) system central to the organization. Today many EIS are bought as packages from vendors such as the German SAP or the American ORACLE.

EIS outsourcing is the practice where the organization *purchases goods or services that were previously provided internally*. We further mean *any* type of outsourcing involving EIS and Information Technology (IT). This includes application development on top of the EIS, operation of a data center running EIS, project management in relation to EIS, business processes enabled by the EIS, or the entire IS function (this definition inspired by Dibbern et al. 2004). EIS outsourcing thus means aggregating specific tasks or entire processes and moving them to one or more outsourcing vendors, typically to a place where wages are lower or where a more appropriate business structure can be provided to deliver the IS goods and services.

Organizations have claimed that IS outsourcing reduces cost and time, increases quality and reliability of product and services, improves business performance, and releases organizations to concentrate on core competencies. A McKinsey study shows that for every dollar that US companies spend on services moved offshore, a saving of 58 cents is achieved mainly on wages, and further concludes "*that offshore services are identical to those they replace – and at better times*". The reasons why organizations outsource IS are dominated by rational explanations related to bounded rationality and opportunism where cost savings seem to be a prevailing explanation repeated in literature

However, though a majority of extant literature finds mainly rational explanations for engaging in IS outsourcing, our own experience from many companies and from many outsourcing arrangements made us speculate whether there was more to it? Could it be that there were both "front stage" rational explanations as well as other different "back stage" explanations – "*behind the curtain*" to use a theater metaphor?

To address this curiosity we set out to study EIS outsourcing in practice. We were looking for candidates that had been undertaking EIS outsourcing for some years and where we could obtain access to both people and archives. We ended up with a large Scandinavian high-tech organization, SCANDI, which is a case with many inter-organizational partners involved in their sourcing arrangements, our research question being: *Why does SCANDI engage in very complex EIS outsourcing arrangements?* Furthermore we decided to apply institutional theory because we could see that the things in play "behind the curtain" were norms, values and other institutional pressures. As we shall see later in the paper this alternative theoretic lens worked quite well.

The paper is organized as follows. First we introduce our research method based on the interpretive paradigm. Then we explain the Institutional Theory which is the theoretical lens used in this paper. The

section that follows outlines the SCANDI case study. The analysis behind the curtain is then presented, and is followed by discussion and implication. Finally, we present some concluding remarks.

Keywords: EIS Outsourcing, Institutional theory, Enterprise Systems, Longitudinal Case Study Research, Interpretive Research

Mapping Agile Methods to ERP: Directions and Limitations

Rogerio Atem de Carvalho[1] – Björn Johansson[2] – Rodrigo Soares Manhaes[3]

[1]Instituto Federal Fluminense, Brazil, ratem@iff.edu.br [2]Copenhagen Business School, Denmark, Lund University, Sweden bj.caict@cbs.dk [3]Universidade Estadual do Norte Fluminense, Brazil, rod@uenf.br

In the context of Enterprise Resource Planning (ERP) customization, a well-known problem is the misalignment or misfit between the ERP functionalities and the business requirements (Soh et al., 2000), caused mainly by communication bottlenecks and difficulties on responding to changes on requirements (Johansson & Carvalho, 2009). Traditionally, heavyweight waterfall-like approaches are applied to try to minimize the misfit problem, with results that are still unsatisfactory. On the other side, the recent years have witnessed the rise and adoption growth of agile methods, which have both close communication and fast response to changes among their main values. Hence, based on a theoretical background and the authors' real-world experience, this paper aims to map, present the limitations, and propose future directions to the application of the main agile practices to ERP customization processes.

The statistics on unsuccessful ERP implementations urges for new ways of facing their customization problem. It can be concluded that agile methods in ERP customization can achieve efficient communication between developers and ERP end-users if some limitations can be overcome. It can also be concluded that a potential benefit in agile ERP customization is the fact that this development approach is adaptive rather than predictive, thus fitting better to a constant changing environment. The main conclusion is that agile techniques for customizing ERPs have a great potential but demands a closer cooperation between different ERP stakeholders, so that customization is based on concrete feedback and not speculation.

The ERP environment faces constant changes and reassessment of organizational processes and technology, therefore project management methods used within ERP deployment must provide adaptability and agility to support this evolutionary environment in which ERP customization takes place. Alleman (2002) and Meszaros and Aston (2007) agree that the application of scientific management – here represented by "high-ceremony" or document-driven processes – is understandable in many ERP deployment cases since many target companies has a tradition in engineering and business that make them think in terms of waterfall development processes. However, Alleman (2002) alerts that "the use of predictive strategies in this environment is inappropriate as well as ineffective since they do not address the emergent and sometimes chaotic behaviors of the market place, the stakeholders, and the vendors' offerings."

In the context of ERP customization, a well-known problem is the misalignment or misfit between the ERP functionalities and the business requirements. It can be claimed that this problem is caused mainly by communication bottlenecks and difficulties on responding to changes on requirements. Traditionally, heavyweight waterfall-like approaches are applied to try to minimize the misalignment problem, with results that are still unsatisfactory. On the other side, during recent years we have witnessed the rise and adoption of agile methods, having both close communication and fast response to changes among their main values. This paper maps some of the main agile methods to ERP development and presents some limitations and future directions on agile methods as an approach for ERP development.

Keywords: Agile methods, enterprise resource planning, software development

Efficient Metadata Loading for Generation and Parsing of Messages in Health Level 7 Compliant Enterprise Solutions

Yasir Mehmood[1] – Farooq Ahmad[2] – Younus Javed[3]

[1,2] Department of Computing, NUST School of Electrical Engineering & Computer Science, Pakistan;
[1]yasir.mehmood@seecs.edu.pk, [2]farooq.ahmad@seecs.edu.pk [3]Department of Computer Engineering,
NUST College of Electrical & Mechanical Engineering,Pakistan; myjaved@ceme.edu.pk

Information technology has started focusing on the healthcare enterprise, for providing better medical facilities for the progress of a nation. There exist different healthcare enterprise standards that are used for the communication of medical information across health enterprises providing swift and reliable results. HL7 is one of those standards that are used for the exchange of medical information between healthcare systems. HL7 versions include v2.x and v3. The focus of this research work would be on the HL7 V3. It claims providing semantic interoperability which is achieved when the message is easily interpretable at the sender and the receiver sides. Model Interchange Format (MIF) is used for this purpose which is a set of XML format to support the storage and exchange of HL7 version 3 artifacts as part of the HL7 development framework. MIF defines a series of schemas in the form of XML files that will hold the content of HL7 V3 specifications. Content of MIF file is also called the metadata for the generation of HL7 V3 message. It is used for the generation and parsing of messages for presenting health related information in standard way. To load MIF, an API is used in HL7 called Java SIG API. The goal of the Java SIG is to develop an actual Java API. It is not simply an implementable technical specification that would provide developers a consistent and cross-platform set of utilities based on HL7 specifications. At present, the API suffers from certain efficiency problems, particularly with regard to generation and parsing of messages for efficient communication of health related information among health enterprises. These inefficiencies are impeding its adoption for production applications.

Efficient metadata loading is a big challenge in the generation and parsing of HL7 V3 messages. This metadata is present in the form of MIF files. Each MIF file contains large number of associations which are necessary to be loaded for the generation of the message. Each MIF can refer to some other MIF with the help of associations. The references to other MIF can results in memory errors like stack overflow even in the case of increased stack size. Divide and conquer approach will be used for the efficient loading of metadata. Memory and timing problems have been encountered while loading all the associations present in the MIF at once. Such problems are handled in this approach by loading associations in the form of chunks, one after the other in the memory. In the first step all of the associations from a single MIF file are identified and the MIF file is partitioned in different memory blocks such that each block contains exactly one association. It is not necessary that all of the associations are assigned to the blocks at once; rather allocation of associations to memory depends on available blocks. There is a possibility that only one association is loaded initially as only one block is available. There is also a possibility that all the associations are loaded in the memory due to availability of enough memory blocks. Besides this an indexing block should also be maintained, in order to contain the information about location of blocks associated to particular MIF. This indexing block will help in fast loading of associations. To cater for the referenced MIF within association issue, the referenced MIF file should also be partitioned by associations and should be loaded in blocks. This will require separate indexing block for the referenced MIF. The address of indexing block will be stored in the parent block (block which will contain index of the association in which the MIF is referenced). When all the blocks are filled and there still remain some associations which are not allocated memory blocks, the process of cleaning up the memory blocks will be carried out. The Least Recently Used (LRU) algorithm of paging is used for clearing less frequently used memory blocks and loading new associations in the emptied blocks. This process continues until all of the associations are not utilized. At the end an HL7 V3 message will be generated and will be ready to be sent on the other end. During parsing of message, all of the associations are not needed to be loaded unlike in message generation; in this case, loading of different associations

depends upon the content of the message. If the reference of an association is given in the message, only then that association is brought into the memory for processing.

This approach would make loading of metadata from MIF files much easier and faster. It would provide efficient memory utilization and error free access to memory. Thus, it would contribute to improved performance of health enterprise messaging system.

The Compiler to Convert C into a Dataflow Graph to be Executed into the ChipCflow, a Dynamic Dataflow Machine

Jorge Luiz e Silva[1] – Kelton A. P. Costa[2] – Valentin Obac Roda[3] – Joelmir José Lopes[4]

[1,4]University of Sao Paulo, Department of Computer Systems, Sao Carlos, Brazil, [1]jsilva@icmc.usp.br [4]joelmir@icmc.usp.br [2,3]University of Sao Paulo, Department of Electrical Engineering, Sao Carlos, Brazil, [2]kelton@eesc.sel.usp.br [3]valentin@sel.eesc.usp.br

In order to convert High Level Language (HLL) into hardware, a Control Dataflow Graph (CDFG) is a fundamental element to be used. Related to this, Dataflow Architecture, can be obtained directly from the CDFG. The ChipCflow project is described as a system to convert HLL into a dynamic dataflow graph to be executed in dynamic reconfigurable hardware, exploring the dynamic reconfiguration. The ChipCflow consists of various parts: the compiler to convert the C program into a dataflow graph; the operators and its instances; the tagged-token; and the matching data. In this paper, a C compiler to convert C into a dataflow graph is described. Some results are presented in order to show a proof-of-concept for the project.

A Dataflow Architecture is an architecture where a natural parallelism is present. This kind of architecture was first researched in the 1970s and was discontinued in the 1990s. With the advance of technology of microelectronics, the Field Programable Gate Array (FPGA) has been used, mainly because of its flexibility, the facilities to implement complex systems and intrinsic parallelism. Thus, dataflow architecture is a topic which has come to light again, especially because of the reconfigurable architecture, which is totally based on FPGAs. On the other hand, much work is being done to covert high level language as a C language into hardware, in order to help engineers to project their systems using a high level of abstraction as well as a digital logic level. In particular, the ChipCflow project is a system where a C program is initially converted into a Dynamic Dataflow graph, followed by its execution in Reconfigurable Hardware. The ChipCflow system begins in a host machine where a C program is edited, to be converted into a control dataflow graph (CDFG) generating a CDFG object program. The CDFG object program is converted into a VHDL where modules of CDFG are accessed from a data base of VHDL modules. After generating the complete VHDL program, an EDA tool to convert the VHDL program into a bitstream and to download it to a FPGA is used

Keywords: C Compiler; Dynamic Dataflow Architecture; Dynamic Reconfigurable Hardware; Tagged-token; Matching-Data

SESSION 2
ANALYSIS AND MODELING
OF ENTERPRISE INFORMATION SYSTEMS

Session Chair: Gergely Babos

ERPs Elaboration and Utilization of Meta Data Mart by Using Oracle BIEE Reporting Tool

Gergely Babos

Budapest University of Technology and Economics, Department of Management and Corporate Economics; eMail: gergely.babos@oracle.com

The main results of system integration projects are the consolidated data. These data can be extracted from the integrated system providing important business information about the whole enterprise. These information are mainly presented in reports. Both the report users and the report developers ask several questions about the content and the processing of the data presented on reports. These questions are for instance:

– Which source systems' data can be found on the report?
– How the data are filtered and transformed during the consolidation?
– What is the data quality, can we trust in these data?
– When was a data refreshed?
– Does the data contain the results of the recent source system developments?
– Who are the data users and what is their activity like?

The above listed questions exceed the limits of the reporting tools, it is necessary to understand the complete consolidation and report representation process. During the implementation of Oracle BIEE reporting tool we elaborated and implemented a meta data mart that supports answering these questions. This data mart stores both the meta data extracted from the reporting tool and the meta data created during the development and the maintenance of the integrated system, that is in our case a data warehouse. We have developed meta reports using the meta data mart. In the first step, we built data quality reports monitoring the data content of the reports. In the second step, we built an extensive report set, that on the one hand supports browsing, on the other hand describes the relationship among reports. These meta reports give furthermore historical overview of report usage and show the complete data integration process behind a single report containing also the actuality of data. I will give an overview of the meta data mart and the report set in my presentation.

Keywords: meta data, data warehousing, business intelligence, meta data mart

Fuzzy EWMA Algorithm for Intrusion Detection

Petar Čisar[1] – Saša Bošnjak[2] – Sanja Maravić Čisar[3]

[1]Telekom Srbija, Subotica, Serbia; petarc@telekom.rs [2]The Faculty of Economics, Subotica, Serbia; bsale@eccf.su.ac.rs [3]Subotica Technologies, Serbia;, sanjam@vts.su.ac.rs

Intrusion detection is used to monitor and capture unwanted intrusions (i.e. attacks) into computer and network systems which attempt to compromise their security. Many intrusions manifest in significant changes in intensity of events occuring in computer networks. The exponentially weighted moving average (EWMA) is a statistic for monitoring the process that averages the data in a way that gives different weight to data as they are further removed in time. For EWMA control technique, the decision regarding the state of control of the process depends on EWMA statistic, which is an exponentially weighted average of all prior data, including the most recent measurements. EWMA values are compared with the upper control limit, and if a value is above it, that situation is interpreted as the appearance of anomaly. By the choice of weighting factor (in publications often noted as λ), the EWMA control procedure can be made more or less sensitive to a different

changes in the process. Because of the ability of EWMA algorithm to monitor the rate of occurrences of events based on their intensity, as well as the relatively simple adjustment of parameters and sensitivity, this technique is suitable for implementation in statistical anomaly detection.

The performance of standard EWMA algorithm can be made more effective combining the concept of adaptive threshold algorithm and adequate application of fuzzy logic. The sensitivity of standard EWMA algorithm can be further improved by implementing the logic of adaptive threshold algorithm (AT – k). Namely, network anomaly in adaptive algorithm is detected only in case when for multiple consecutive time intervals the upper threshold is exceeded. Threshold algorithm in general relies on testing whether the traffic, i.e. number of packets, over a given time interval exceeds a particular threshold, calculated from historical data.

The approach to the problem of intrusion detection by inducting the fuzzy logic into improved EWMA algorithm can be realized through several phases: the definition of input and output fuzzy values, empirical definition of fuzzy rules and fuzzy relations on the basis of which adequate conclusions will be formulated and the definition of membership function that describes the appropriate fuzzy sets. In case of fuzzy EWMA algorithm, input (variable) fuzzy measures are EWMA traffic values, and the number of consecutive threshold exceedings, while the output measures are intrusion alarm, warning alarm as well as the indication of normal network condition. The paper discusses different aspects of fuzzy rules as well as different membership functions, trying to find the most adequate shape for this case.

In this way, the realization of precaution of a possible network attack is enabled, which contributes to raising the level of system security in general. This is the most important advantage of here introduced approach.

Keywords: intrusion detection, EWMA, control limits, fuzzy rules, membership functions

Using Data Warehousing Technologies in the Development of a Time Series Analysis Software

István Kiss M.[1] – Ferenc Brachmann[2]

[1]*Széchenyi István University - Interdisciplinary Doctoral School; Processorg Software 82 Kft., Hungary, kiss-mihaly.i@processorg.hu* [2]*University of Pécs - Faculty of Business and Economics, Hungary; brachmann.ferenc@ktk.pte.hu*

The goal of business intelligence software is to create useful knowledge from data about the business processes of an organization. A large portion of these are time series and are vital to ERP, CRM and HRM processes and systems. This paper presents the findings of a software development project that aims to develop an application that handles the integration of times series data analysis and data warehouses: scheduled data loading into data warehouses with data set versioning. Based on the time series data warehouse the software provides an interface which gives a powerful analysis tool both for the experts in time series analysis and for the goal-oriented users without having deep statistical knowledge and methodological background. For the experts, the expandable list of statistical methods, for the latter group the methodological aid which is called "embedded expertise" is available to predict the future or understand the past. The software provides the ability to automatically share the results with the other users by scheduling and publishing and with an interface also gives the opportunity of presenting time series data with other professional data visualization tools.

Modeling and Analysis of Information Security Starting from ISO/IEC 27001 Standard and Customer Loyalty Relationships

Anna Medve[1] – Klara Kövesi[2]

[1]University of Pannonia,Hungary; medve.anna@almos.uni-pannon.hu [2]University of Bretagne Occidental, France; klara.kovesi@univ-brest.fr

On the verge of the Future Internet, international standards for a number of suitable techniques on security fields are available, related on information technology and on e-business models, processes and rules, by unifying security techniques in different aspects and avoiding relevance to organizational view of security.

The focus is on the fact that majority of new emergence in information systems has implied by needs of "e-everything" services and its increasing need for interoperability. The establishment of these new emergences for e-services is not a software evolution process - its introduction requires strategic planning on the level of business processes following by the needed software system's re-engineering process.

As an evolution of our previous proposals for re-engineering with tools based on international standards, in this paper we propose the goal-oriented framework for modeling and analysis of information security based on ISO 27001 and ISO 27002 standards. The framework abilities are involving business decisions makers to using it and making the simulations and negotiations themselves. We are integrating in the framework two methods from the team's research results on the relation between the switching barriers perceived by customers and their loyalty development to the service providers. These methods for the separation of switching barriers according to their negative or positive effects on motivation and attitude of the customers leads to the development of different marketing strategies. A case study in the field of e-logistics is given.

Keywords: Modelling Information Security; ISO/IEC 27001/27002; Customer Loyalty; Consumer Behaviour; Non-Functional Requirements integration within Functional Requirements; URN; jUCMnav

Enabling Long Term Synchronization of ERPs and Businesses through Enterprise Architectures

Björn Johansson[1] – Philip Holst[2] – Stefan Henningsson[3]

[1,2,3]Center for Applied ICT, Copenhagen Business School, Denmark [1]Depaertment of Informatics, Lund University, Sweden, eMails: [1]bj.caict@cbs.dk [2]ph.caict@cbs.dk [3]sh.caict@cbs.dk

Adoption of standardized software packages such as enterprise resource planning (ERP) systems, demands that either the system is adjusted to existing business processes or that business processes are adjusted to the system's inherited processes, resulting in alignment problems. In current research alignment refer to actions taken during the process of designing and implementing new software. Implicitly embedded in the alignment terminology is a one-shot approach with the objective to harmonize business processes and supporting ICT. This paper explores the idea that instead of alignment, organization-technology synchronization would be a more appropriate concept, since an organization's business processes as well as the technology used are continuously evolving and constantly needs to be re-aligned. The question is then how synchronization could be achieved and if any tools exists that could support this. Enterprise architecture (EA) could be seen as a tool to increase organization-technology synchronization. We theoretically integrate EA and synchronization to arrive at a set of propositions on how the use of EA can enable long term ERP-business synchronization. The conclusion is that EA definitely could be a way of supporting synchronization. However, more research is needed to support the statement.

Organizations today face the challenge of quickly responding to changes in market conditions. They need to have high agility when it comes to their business processes, but also to the information and communication technology (ICT) they use. In addition, contemporary business organizations face a demand of having high interoperability between internally used ICT and the ICT their partners, suppliers, and customers are using. One way to fulfill these demands is by implementing enterprise resource planning (ERP) systems. Implementing an ERP system is, however, a complex and costly endeavor which could result in a lack of alignment between how the business processes are carried out in the organization and how the business processes are supported in the ERP system. There has been a lot of focus both in practice as well as in the academic field on alignment describing the problem of alignment but also on how to solve what could be described as an misalignment problem. However, the concept of alignment has a built in flaw. Even if total alignment is achieved the success will still only be temporary due to the constant changes in business processes caused by the dynamic market environment in today's business world, unless the ERP system changes according to the business processes. In addition, the technology in ERP systems changes just as fast as the business processes leaving companies with lost opportunities for competitive advantages enabled by technology evolution, if the companies cannot change their business processes to utilize the new technology.

Keywords: Business processes, Business synchronization, Enterprise architecture, Enterprise resource planning systems

Applying Neural Networks for eGovernment Projects' Goal Indicators Analysis

Bálint Molnár[1] – Andrea Kő[2]

[1,2]*Corvinus University of Budapest, Information System Department, Hungary*
eMails: [1]molnar@informatika.uni-corvinus.hu [2]ko@informatika.uni-corvinus.hu

The paper discusses the approaches offered by artificial intelligence for the analyses of e-Government projects' indicators. We investigate the following research questions: Whether does any other sensible employment parameter exist that could reveal the impact of projects executed in the programme at country and at regional level; while the analysis keeps an eye on the macro-economic parameter influencing the operation of national economy? This problem is characterised by several interrelated factors, which are hidden or can't be described by mathematical equations. We propose a research model based on neural networks which supports the evaluation of Public Employment Service modernization projects' effectiveness, through the analyses of the project's indicators.

Employment services play key role worldwide recently, because of the economic crisis and its consequences of the growing unemployment rate. Public Employment Service (PES) in Hungary has a strategic goal to become the largest human resources development organization within Hungary by 2013-2015. To achieve these objectives, strategic projects have been performed in the field of e-Government at PES, aiming modernization, improvement of employment services, and development of IT infrastructure for supporting these services. To measure the success of modernization projects is a key interest of both PES and sponsor organizations, but at the same time it is a challenging task with numerous, interrelating indicators. The projects' evaluation often requires new innovative solutions, which takes into account other sectors' economic variables and the general macro-economic parameters of the country as a whole. Artificial intelligence offer alternative ways to the traditional statistical approaches providing insights into the real impacts of the changed business processes and IT investment supporting the new employment services.

The paper discusses the approaches offered by artificial intelligence in the analyses of e-Government projects' indicators. We investigate the following research questions: Whether does any other sensible employment parameter exist that could reveal the impact of projects executed in the programme at country and at regional

level; while the analysis keeps an eye on the macro-economic parameter influencing the operation of national economy? This problem is characterised by several interrelated factors, which relations are hidden or can't be described by mathematical equations. We selected neural networks as a modelling tool, because they work well in these situations. They have beneficial characteristics, like they behaves similarly in some sense as human brain; they have the capability to "learn" from data of past (from known samples, a priori data) and they can apply the learnt experiences for either new samples or forecasting.

The paper presents statistical-econometric techniques based on learning mechanisms, with a view to analyzing and taking advantage of the forecasting capabilities of the neural network techniques, to assess various goal indicators related to the economic and employment situation. There are well-developed and established methods for statistical analysis of the labour markets in Hungary, but there are fewer artificial intelligence related results available. We provide a model based on neural networks, which supports the PES modernization projects' effectiveness evaluation, through the analyses of the project's indicators. The paper discusses project monitoring requirements and the artificial intelligence related background of the proposed model too.

Keywords: project evaluation and assessment, intelligent systems, artificial neural network, machine learning

Creating a Framework for Supporting the Rapid Development of GPS-enabled Location-based Services for Multiple Mobile Platforms

Ferenc Brachmann[1] – Szilárd Farkas[2]

[1]*University of Pécs, Faculty of Sciences, Hungary; brachmann.ferenc@ktk.pte.hu*
[2]*ESRI Magyarország Kft., Hungary; szilard.farkas@esrihu.hu*

Location-based services hold great potential in the future of mobile computing. Up till the present time, all applications aiming to provide these services to consumers were custom developed with very little support for the special technological challenges lying ahead of developers. Beside this problem, the possibility of using several location-based services at once is needed. Users need to be able to have single-sign-on (SSO) capability and a common control set to effectively use these applications in a customized fashion.

The rapid spread of social networking applications has had a great effect in today's computing environment. Using social networks in location-based services creates a new environment for these applications. The ability to locate the user can be spread across multiple social (or commercial) networks at once. This enables the development of a new generation of location-based services: not only can these applications be interconnected, they can also be customized to any user-group within social networks. These possibilities create technological challenges to developers: integrating a common map-base with social networking and GPS data transport is vital.

To tackle these technological problems, the research team of ESRI Magyarország Kft. has created the MobileSocial framework for the support of rapid development of GIS/GPS-based location-based services for Windows Mobile and JAVA platforms.

Keywords: GIS, LBS, Location based services, mobile telephony

Enterprise 2.0 Web-Application Models

Adam Tarcsi

Eötvös Loránd University, Faculty of Informatics, ade@inf.elte.hu

Web 2.0 based on global cooperation and also on the content (data). This is the most important part of these applications. At enterprise environment workflows and (data) processing are at the centre of composition. Enterprise 2.0 applications are browsed-based software in the office with Web 2.0 style participation on enterprise IT system. These applications integrate Web 2.0 functions with the traditional enterprise softwares, like social network services, tagging and wikis with the groupware and document management systems.

Applicable Web 2.0 functions depend on the size of the enterprise, on the industry and also on the environment where the corporation operate. At the same time business applications with Web 2.0 functions should also suit the enterprise's efficiency, reliability, security and quality requirements.

What do Enterprise 2.0 and related technologies mean? How and what can an enterprise adopt Web 2.0 functions into business applications? Among others I would like to answer these questions pending my article. Without defining the exact meaning of Web 2.0, we should acknowledge that the usage of the Internet has changed and as a bottom-up process across the Internet users (employees) it has influenced the enterprise applications also. Initially Web 2.0 is based on the Internet users as the web sites reach higher interaction level with; in other words, everyone can become the author of the - dynamical - content with a basic IT knowledge. Web is the platform where users create and shape their own experience. It is not the user is who has to learn web programming or using difficult web applications, but it is the developer who should know more about the users or about users' demands and requirements. Internet applications can be successful on the market if they meet the user expectations. On the other hand, isolated, local (enterprise) applications move to the web as well.

In the meanwhile there are some barriers also to write and manage blogs, wikis, etc. To write more documents takes more time to the employees without producing. Seemingly to share the knowledge is also decreases of the importance of the single user, employee; changes of thinking need motivation. Browser-based software has also limitations, it's always need Internet connection and the accessibility of the server. Rich media applications need high bandwidth

Keywords: Enterprise 2.0, Web 2.0, SOA, Cloud computing, Enterprise Mashup

SESSION 3
DEVELOPMENT TECHNOLOGIES

Session Chair: Abreu Fabio Pinherio

A Process to Monitor the Software Acquisition Based on Verification and Validation

Fabio Pinheiro Abreu[1] – Pedro Porfírio Muniz Farias[2] – Adriano Bessa de Albuquerque[3]

[1,2,3] University of Fortaleza (UNIFOR) – Masters Degree in Applied Computer Sciences (ACS) Brazil; eMails:[1]fabiopinheiroabreu@gmail.com, [2]porfirio@unifor.br, [3]adrianoba@unifor.br

Nowadays, the organizations acquire more and more technology solutions, obtaining software development services from suppliers. The need to obtain high quality solutions, rapidly, with low cost and adequate technologies is growing. The motivation to this is based on the necessity to improve the efficiency of their services on a highly competitive market.

The acquisition of software development services, however, is a complex process, mainly because of the software requirements characteristics and the existent conditions. This environment presents risks to both of the partners, suppliers and acquirers, and is so normal the existence of serious conflicts on their relationships. To minimize these risks is fundamental the participation of the acquirer's collaborators on the definition of the requirements and on the verification and validation of the work products prepared by the suppliers.

According to the Chaos Report from the Standish Group only 16.2% of the projects are considered successful, that is, the project finished on the defined timeline and budget and all the specified requirements were implemented. Besides, 52.7% of them are finished, but, above the budget, after the defined timeline and only some requirements are implemented. The remains, 31.1% of the projects, are canceled on some point of the project's life cycle. This report lists the main reasons to achieve a successful project: 1) users' involvement, 2) high managers' support and 3) specify requirements clearly. We can see that the complexity is greater on acquisition projects.

A process to acquire software development services can be divided in two phases. The first one comprises the necessary activities until the agreement between the partners, for example: the scope definition, the proposals demand and evaluation, selection of suppliers and contract's assignment. The second phase consists of activities related to the monitoring of the contract, for example: execution of software development services, verification, validation and the acceptance of the work products, and the management of the contract. This phase will be denominated, on this work, of Monitoring of Acquisition Phase.

This work proposes a process to monitoring the acquisition of software because the main works related to acquisition emphasizes the detail of the activities until the contract's assignment and the greater effort of an acquisition is exactly the monitoring of the supplier's contract. The approach proposed to the monitoring of acquisition process highlights the importance of two activities: the requirements specification and the verification and validation of the work products, as fundamental to obtain the alignment between the supplier and the acquirer, in relation of the monitoring process's goals and results.

This work proposes a process to monitoring the acquisition strongly based on the users' involvement and the clearness of the requirements. On the environment of acquisition we can consider the user as member of the acquirer. The effectiveness of his participation is very important to maximize the chances of success of the project. The proposed approach emphasizes the activities related to the requirements specification and verification and validation as critical factors to the success of the monitoring of the acquisition and consequently to the project. Considering an iterative and incremental approach, on the beginning of the iterations, the acquirer and the supplier should prioritize the definition of the requirements which must be implemented. On this activity, the commitment with the project's scope must be obtained, minimizing the absence of understanding and consequently, possible errors related to the needs of the acquisition. During the iteration the supplier will implement the scope and both, acquirer and supplier will participate of the verification

and validation of the work products. This is a fundamental cycle, comprising the activities of the proposed process.

The cycle, previously mentioned, will be repeated in each phase of the development. Firstly, the understanding of the requirements and the verification and validation criteria between acquirer and supplier are emphasized. Then, the development of the work products will be done by the supplier, being monitored and inspected by the acquirer. Closing the cycle, on the delivery of each artifact, the emphasis will be again on the execution supported by activities of verification and validation. The inadequacy of the requirements set and the vagueness of the verification and validation can be seen as the causes of the unsuccessfulness of software development acquisition. The monitoring of timelines, costs, solution of problems, contracts adjustments and others administrative aspects, do not related directly to artifacts preparation also can be seen as tasks which must be shared between acquirer and supplier. Both of them should define corrective actions to guarantee the attendance of the verification and validation criteria. During the execution of the process, the formal and informal communications should occur frequently, permitting, properly, the monitoring of the acquisition.

The proposed approach uses the main characteristics of standards and maturity models which deal with the subjects related to it, including: Capability Maturity Model Integration (CMMI), eSourcing Capability Model (eSCM), Brazilian's Software Maturity Model (MPS.BR) and Project Management Body of Knowledge (PMBOK). It comprises six macro-activities: Prepare the monitoring plan, Define/Review the understanding of the iteration's requirements, Manage the monitoring, Execute verification and validation, Manage actions and changes and Evaluate the process. Nowadays, the process is being evaluated from an experience of use, where the Government of one of the states of Brazil is managing the development of the Software to Governmental Management (S2GM), carried-out by one of its suppliers.

Keywords: Software Acquisition, Software Verification and Validation, Software Processes

Re-conceptualizing ERP Implementation as an Articulation Process

Lene Pries-Heje

Copenhagen Business School, Denmark; eMail: lph.inf@cbs.dk

Much research on ERP implementations perceive rationalizing business processes or implementing "best practice" work processes as the key issue when implementing ERP systems. This paper is based on a different understanding, however, instead of re-engineering individual business processes the key issue when implementing ERP systems is understood to be the creation of an organization-wide process protocol that provides a basis for coordinating work in heterogeneous and distributed work environments. Following this line of thoughts the paper argues that articulation theory can be used to provide a coherent understanding of the implementation process; re-conceptualizing an ERP implementation as an ERP articulation process. Doing so provides a novel way to understand many of the problems experienced in organizations striving to arrive at a satisfying result when implementing ERP. Thus it provides a way to understand the interplay between the organizational work arrangements and the design of the IT artefact, and a way to understand the connection between the design process and the problems experienced after go-live.

This paper is explaining how an ERP implementation can be understood as an ERP articulation process. The idea of using articulation theory and the arguments how to adapt it to ERP implementations, however, grew out of a comprehensive research project including an in-depth case study and focus groups with experienced ERP implementation professionals (anonymous – author's work). I have used small examples from this empirical work as illustrations throughout the paper. A literature review in the above mentioned research project showed that in general the central issue when implementing ERP package software is regarded as simply rationalizing business processes or implementing "best practice" (work processes build into the

software). My argument is, however, that although these issues may be relevant the fundamental problem that ERP software addresses in many organizations is much more complicated and is about standardizing and coordinating work.

Regarding ERP software as "standard" software providing "best practice", and understanding the implementation of the software as simply a matter of re-engineering the organizational business processes, means that some very important points are missed. First of all ERP software is not "standard" software in the sense that it provides *a* solution; it provides a repository of organizational work patterns that organizations can combine to become a solution, and furthermore the organization can decide on customizations if necessary. Secondly, implementing ERP systems is not simply about re-engineering *individual* business processes; it is about creating an organization-wide process protocol that provides a basis for coordinating work in heterogeneous and dispersed environments.

Following this line of thought an ERP implementation is basically about arriving at a *federal process protocol*; a protocol based on the principles of standardization and segregation providing coordination and standardized data in heterogeneous and distributed work arrangements. My claim is, that if you accept that standardizing data and providing coordination in heterogeneous and distributed work arrangements are the central goal in many organizations when implementing ERP systems, then ERP implementations can be understood as an *ERP articulation process* (explained in more details in the following sections).

Re-conceptualizing an ERP implementation as an articulation process has significant effect in the sense that it provides a coherent way to understand the interplay between the organizational work processes and design of the IT artifact, and the connection between the design process and problems observed after go-live. Hence perceiving an ERP implementation as an ERP articulation process provides a novel way to understand many of the problems experienced in organizations striving to arrive at a satisfying result of an ERP implementation.

The reminder of this paper is structured as follows: First a section introducing articulation theory, followed by a section explaining how articulation theory can be adapted to ERP implementations. Finally the paper is concluded by a section discussing the significance of re-conceptualizing an ERP implementation as an ERP articulation process.

Keywords: ERP implementation, articulation theory, coordination mechanisms, socio-technical design

Handling the Specialties of Agile IT Projects with a New Planning Method

Judit Kiss[1] – Zsolt Tibor Kosztyán[2]

[1,2]Department of Management, University of Pannonia, Hungary
eMails: [1]kissjudit@gtk.uni-pannon.hu [2]kzst@vision.vein.hu

In this study a new planning method is introduced namely the Project Expert Matrix which could be used so far in case of IT projects, especially in those cases in which the classic methods could not handle the problems and specialties. In this method the tasks and the relations between tasks are handled as stochastic variables within an adjacent matrix. PEM cannot only be used in case of IT projects which follow the traditional approach but also in case of agile approach. It often happens that a duration and budget are determined and the project has to be completed within these restrictions. Our method can plan these agile IT projects as well. With PEM IT project managers can raise some logic plans which are optimal according to target function(s). In case of the traditional approach the goal is to complete the scope with minimal time, cost or minimal demand of resource (or with more target functions together). In case of agile approach time and cost are fix points, and the goal is to realize the project with the given budget and duration while reaching the best possible quality.

It is a strategic decision to start a project and to determine the goals, the scope and the (time, resource and cost) limits of the project. The planning, scheduling and the completion of the project are the exercise of the operational level of the company. There is a transition between the strategic and operational levels of the company, because the goals are given (what to do), but the ways of reaching the goals are not determined (how to do). Some questions are arisen especially in case of IT projects. Do IT project managers or experts use any methods for planning at all? In some cases they do not use methods at all, because they want to solve the problems without plans.

The other question is whether any methods should be used in case of IT projects? Planning is a very important part of the project management in case of IT projects, too. If the project tasks, the duration and resource demands of each task, the precedence of tasks, and the budget of the project are not determined, the realization of the project cannot be compared to plans.

Can the classic methods be used in case of IT projects? Although there are some methods to help planning, scheduling and tracking projects, these classic project management methods (e.g. CPM, MPM, PERT) were developed to classic (e.g. construction) projects. So these methods cannot be used to handle the specialties of IT projects. It shows that the operational level needs more support especially in agile approach of project management.

Keywords: agile project management, IT projects, Project Expert Matrix

A Parameter Optimal Deployment Method
for Product Development Process

Min Li [1] Xiansheng Qin [2]
[1]KunMing University of Science&Technology ,Kunming, China; leah163@163.com
[2]Northwestern Polytechnical University, China; xsqin@nwpu.edu.cn

How to implement the product development time, quality, cost, service and environment integrated optimization is one of the most important issues in researches of product development. Product development process (PDP) optimization should be an integrated optimization globally aiming at five targets above.

Integrated optimization of PDP means integrated optimization or deployment of process parameters according to product development targets. In the final analysis, product development targets would be realized through every specific process, that is to say, targets about time, quality, cost, service and environment is deployed into the whole PDP to get specific indexes or parameters at each level. These indexes or parameters working together make the five targets reasonable in whole product development process, or globally optimal solution.

PDP could be regarded as a extremely non-linear, complex and gigantic system. To managing and controlling scientifically such a system, PDP modeling is the first problem to solve in researching and optimizing PDP. As a support tool, this paper put forward a ProA (Activity and its process)-based PDP modeling method. It organizes the PDP information and knowledge by base unit ProA. Through decomposing ProA and ProA connection layer by layer, time, quality, cost, service and management targets of PDP are deployed into ProA attributes in various layers, which helps describe PDP and process information systematically from multi-angle of view.

Based upon ProA model, a complete PDP parameters integrated optimization method is proposed and detailed workflow is designed. Using Quality Function Deployment for reference to deploy PDP layer by layer from top to bottom, with ProA as basic unit, this method emphasizes process parameters deployment as decomposing and constructing whole PDP, meanwhile a set of optimal evaluation indicator system should

be established. Following ideas and work program of PDCA circle, workflow of process parameters deployment and optimal evaluation indicator system construction are discussed.

Keywords: agile Product Development Process, PDP, ProA, PDCA circle

SESSION 4
KNOWLEDGE MANAGEMENT

Session Chair: James Jones D.

Things to Think About, When Thinking of About Enterprise-Wide Information: Knowledge Representation Issues

James D. Jones[1] – Susanna Badiola[2] – Li Xu[3]

[1]Computer Science, Liberty University, james_d_jones@hotmail.com [1]Centre for Advanced Intelligent Systems, Texas Tech University [2]Philosophy, Angelo State University [3]Information Technology/Decision Sciences, Old Dominion University, USA

It is a reasonable proposition to suggest that a high level, meta-reasoner for Enterprise Information Systems should exist. Such a reasoner could act as a monitor, manager, planner, and trouble shooter for the information resources of an organization. The lead author has built such a reasoner, which is now in its nascent stages. The software is based upon a logic programming paradigm, and employs powerful reasoning formalisms recently developed within the logic programming community. One of those formalisms is a theory of actions. A key component of an action theory is the ability to reason with respect to time. Another key feature of an action theory is the ability to reason about the value of variables that can simultaneously take on different values determined by the context (i.e., time). These issues (time, and the values of variables with respect to time) taken together comprise what is known in the field as situation calculus. The variables that vary with respect to time are called fluents. There does not exist a methodical analysis or taxonomy of fluents to be used when reasoning about a domain. This paper attempts to discuss some knowledge representation issues as they relate to fluents related to Enterprise Information Systems in the hopes of moving towards such a taxonomy.

Enterprise Information Systems (EIS) are deficient in automated over-arching, high-level reasoning systems (or mechanisms). Such systems or mechanisms are under the purview of meta-reasoning. Meta-reasoning "is any such strategy that involves the monitoring, modeling, and control of cognition. The primary author of this paper has put forth the proposition and the architecture for a meta-reasoner for EIS. Such a meta-reasoner can reason about the total information resources of an organization. The results of such reasoning include identifying anomalies that could indicate problems, and making judgements (positive and negative) about the overall health of the organization (or any component of the organization). These types of reasoning can be viewed in a "macro sense" (i.e., at a "high level"), or in a "micro sense" (at a very detailed level).

The primary author has developed a simple system to perform such reasoning. This system is written in a logic programming language [4-6], and relies heavily upon a theory of actions as a knowledge representation scheme. Theories of actions reason with respect to time. As such, any system employing these techniques can introspect about its beliefs with respect to time. An example of such reasoning is the following. Let *X* be a proposition. The system can assert "I now believe *X*, and have believed it since last Wednesday. Prior to that, I was not sure what I believed. However, two months ago, I believed that *X* was false." This reminds one of the often quoted statement from the Watergate senate investigation of the 1970's: "What did he [Nixon] know, and when did he know it?". This investigation concerned President Nixon's involvement in a political espionage cover-up scandal that resulted in his premature surrendering of the presidency.)

A fundamental idea in theories of actions is a notion called *fluents*. A fluent is a time-varying variable that takes on specific values with respect to specific times. An example of a fluent is something like the president of the US. At any moment in time, the value of that fluent is unambiguous. The value of that fluent right now with respect to 1997 is Bill Clinton. The value of that fluent right now with respect to 1962 is John F. Kennedy.

These statements "value .... right now with respect to ..." demonstrate the intricacies that can be involved when reasoning with respect to time. There are two references to time in each of these statements. One is "as of right now". The other is "in 1997" (or in the other statement "in 1962".) It is quite conceivable that as

of five years ago, we maintained a different value (or a different belief) for who the president was in 1997. A robust reasoning system should be able to represent and reason about these subtleties. he system developed by the author can perform such subtle reasoning. There does not exist a structured approach to identifying the fluents that are necessary, or desired, in a specific domain that is being reasoned about. That is, there does not exist a taxonomy of fluents. This paper is an early attempt to understand the kinds of things one would expect to reason about when acting as a meta-reasoner for an EIS. (Actually, the ideas presented here are more general than EIS, but are applied to examples in an EIS.)

Keywords: Logic programming, artificial intelligence, knowledge representation, expert systems, meta-reasoning, situation calculus

The Three-dimensional System of Knowledge, Innovation and Controlling and the Role of IT-framework

Péter Kristóf

University of Pécs Faculty of Business and Economics Institute of Applied Business Methods, Hungary kristof.peter@gmail.com

Successful companies – independent from the field of the business activity – significantly rely on innovative approach of the challenges they face every day. Being innovative requires a critical mass of knowledge. The measurement, evaluation, classification and systematisation need effective controlling processes. The externalisation, sharing and documentation of corporate knowledge are inconceivable without an efficient information technology framework.

The field of knowledge management (KM) became one of the most important sources of competitive advantage. However, as to how KM can be harnessed for the pursuit of innovation has yet to be firmly established. In our research we discuss the significance of knowledge by describing the transition from 'information revolution' to 'knowledge revolution'. The more innovative an industry is the more knowledge-added is needed to survive in fierce competition. Knowledge management becomes an intentional and systematic tool for evolving a proliferate environment to acquire, create, process, share, apply and perpetuate knowledge – the main (but not only) resource of profit generating activities.

Controlling the contribution of knowledge management can help organisations to realise competitiveness, enhance the level of customer relationship management, reduce costs or boost innovation-cycles. In case we would like not only to control but measure the direct effect of knowledge employed on corporate performance and result we have to set up a multi-stage evaluation model. The study explains – by giving practical examples and reflecting on open questions – how the deployment of the multi-stage evaluation model – which consists of four phases as follows: (1) Innovation-Supply-Chain; (2) Innovation-Funnel, Scorecards, Status model; (3) Think-Tank; (4) Innovation-manager – together with the introduction of different controlling tools can contribute to the birth of new ideas – as origins of innovations.

The paper also proposes a framework (a strategic tool) for the intensified exploitation of information technology which leverages knowledge innovation by providing perspectives on knowledge-centred principles, knowledge-sharing infrastructures and knowledge-based initiatives, to offer an integrated view of employing knowledge controlling concepts for the management of innovations. Furthermore, the framework enhances the return on knowledge and innovation investments.

Finally, it outlines the future challenges of information technology in the complex system of knowledge, innovation and controlling and tries to derive further research theses.

Keywords: controlling, innovation, knowledge management, information technology

Knowledge Discovery Improvement by Utilization of Diversified Data Analysis Tools

Grljavić Olivera[1] – Bošnjak Saša[2] – Bošnjak Zita[3]

[1,2,3]*University of Novi Sad, Faculty of Economics Subotica, Serbia;* [1]*Oliverag@eccf.su.ac.yu*
[2]*bsale@eccf.su.ac.yu* [3]*bzita@eccf.su.ac.yu*

Data mining, as part of the knowledge in data discovery (KDD), is a process of using one or more computational techniques in automated search for hidden information and relationships among data. Knowledge discovered through different data mining methods and techniques reveal behavioral patterns, profiles of entities, and similar regularities in source data. Data analysts have a great responsibility to carry out the interpretation of the results obtained by the application of available tools, and to give a meaningful explanation of what forms the results.

Many data mining techniques and existing algorithms developed with purpose of knowledge discovery, sometimes even the same algorithm applied repeatedly to the initial dataset, can result in different outputs, emphasizing some specific aspect of revealed knowledge. In addition to diverse outputs, data mining algorithms can lean on different visualization techniques in presenting the results, which enable better insight into the input data structure, and relationships of analyzed entities. Consequently, diversified findings and additional information attained from different tools is of great use in knowledge discovery.

In this article we described a composite approach to data analysis, which implies an application of diverse tools, methods and techniques for data mining. The application of different clustering techniques for analyzing data on small and medium sized enterprises (SMEs) in Vojvodina province, Serbia, in order to obtain results which could support the development of SMEs sector, is explained in detail. Within the composite approach to data analysis process, we managed to take advantage of the utilization of DataEngine (DE), Intelligent Data Analyzer tool (iDA), and Waikato Environment for Knowledge Analysis (Weka) tool, when clustering tasks, such as profiling SMEs, are in question. Application of each tool added additional information to the previously discovered knowledge. We presented these results in short in the paper.

In order to obtain as qualitative outputs as possible, and to facilitate the interpretation of results, analysts should combine different tools in the process of data analysis. This approach significantly simplifies their work in knowledge discovery, by helping them in the interpretation of results, and facilitates the derivation of detailed and clear conclusions. Hence, collecting and compounding various information about derived outputs, contributes to improved decision making.

Keywords: Data mining, clustering, DataEngine, iDA, Weka

A Use Case of Service -based Knowledge Management for Software Development

Hannes Eichner[1] – András Micsik[2] – Máté Pataki[3] – Robert Woitsch[4]

[1, 4] *BOC Asset Management GmbH Vienna, Austria*   [2,3] *MTA SZTAKI, Budapest Hungary,* [1]*hannes.eichner@boc-eu.com* [2]*micsik@sztaki.hu* [3]*mate.pataki@sztaki.hu* [4]*robert.woitsch@boc-eu.com*

Large, international cooperative efforts pose high expectations for knowledge management support. In this paper we present a use case of a knowledge management solution in an international research project, which offers several novel features applicable in other cases as well. The primary goals are to make the implicit knowledge explicit, to organize knowledge objects according to multiple criteria of multiple user roles and to serve this knowledge to users in an interactive way adapting Web 2.0 principles. A Knowledge Management System called the BREIN Roadmap has been realised applying service-based knowledge management using PROMOTE® supporting developers and externals who want to make use of the know-how and software components of the project.

A crucial success factor for research projects is to enable the distribution of the results and the insights to the community and to the outside world to allow the take-up and ensure the sustainability of the project. In EC funded research projects, experts from several countries and organizations work towards a common goal. All of them bring their existing knowledge, experience and culture into the project, and produce results jointly, which are of interest for a greater community. The challenge is that the knowledge is highly distributed, very heterogeneous and mostly not directly accessible as it resides in the people's heads. Therefore, knowledge management tools are assumed to help project participants to share current project knowledge, contribute to it, and furthermore, new project members and people outside the project should be supported as well to acquire knowledge about the project.

In the paper we introduce the knowledge management approach and tools applied in the BREIN project. Our goal is to make the implicit knowledge explicit, to organize knowledge objects and to facilitate the usage of the BREIN knowledge objects for the project consortium and for externals who are interested to make use of the BREIN platform.

The present paper is structured as follows: Chapter 2 introduces the PROMOTE® methodology which has been the selected knowledge management approach. Chapter 3 introduces use case in BREIN where a knowledge management system for software development has been realized. The focus is on the three phases the system is based on: Knowledge Management, Knowledge Usage and Evaluation. In chapter 4 the conclusion and outlook is provided.

Keywords: knowledge services, service-based knowledge management

SESSION 5
EFFECTIVENESS, COMPETITIVENESS OF ERPS

Session Chair: Miklos Herdon

ERP-ECO Model System for Economic Evaluation of ERP and its Application in SMEs

Miklós Herdon[1] – Tünde Rózsa[2]

[1,2]*University of Debrecen, Hungary; eMails: [1]herdon@agr.unideb.hu   [2]rozsa@thor.agr.unideb.hu*

According to the opinion of experts selling ERP in Hungary today decisions concerning the implementation of ERP systems are made along two lines basically. One of them is functional suitability and the other one is the purchase price. Of course these two factors are far from being satisfactory to make a good decision and so in a certain number of cases it is already in the implementation phase that the suitability of the chosen product is suspected. In such a case, however, the project can be stopped and restarted only in exceptional cases. Of course, such a case entails considerable expenses and an increase in the distrust of the company's employees, which in turn will also make the implementation of subsequent projects more difficult.

We have developed a model for economic evaluation called ERP_{ECO}. This model can support decision-makers in their evaluation processes. In building process of this model we have collected many new and traditional methods and indicators which work integrated in our model. They are TCO, NPV, ROI, EVA, IRR.. The evaluation process differs from project to project but there are standard points that occur in most implementations. For the purpose of evaluating ERP systems a decision supporting system ERP_{ECO} has been developed, which consists of several sequential modules. As regards giving the data, there are three important modules: "License calculator", "Expenses" and "Quick calculator" modules. The "License calculator" calculates the price of the license depending on the functions. Minor expenses, such as, hardware, software, consulting, personal costs and other categories related to the implementation of ERP can be given in the "Expenses" module. The "Quick calculator" quantifies functions of certain factors, direct and indirect earning resulting from increasing income and decreasing in costs. The calculator does the evaluation in the "Summary", "FIA" and "Diagrams" modules. The textual evaluation can be prepared in the knowledge of these data. Taking into account the acquisition costs, ERP has become a dominant part of IT investments of small and medium sized enterprises. When costs are high and represented hard factors in evaluation process, many benefits are elusive. The economic evaluation of an ERP implementation is a difficult process.

There are studies which make evaluation on base of users viewpoints. One of this is a measurement model by Delone and Mclean. Their model proposed six major dimensions of information systems: Information Quality, System Quality, User Satisfaction, System Use, Individual Impact, and Organizational Impact. This model argues that system quality and information quality singularly and jointly affect both use and user satisfaction. While use and user satisfaction have a positive or negative impact on the other, use and user satisfaction are direct antecedents of individual impact. Lastly, this impact on individual performance should eventually affect organizational performance. Other two researchers, Sanders and Garrity, added this model with two factors; organizational and socio-technical systems. In Sanders and Garrity model, the investigation was placed on base of general system theory and was identified four sub-dimensions of user satisfaction: Interface Satisfaction, Decision Support Satisfaction (DSS), Task Support Satisfaction (TSS) and Quality of Work Life Satisfaction (Garrity-Sanders, 1998). Researches got publicity and the practical experiences shows too, that an ERP implementation depends from users and from satisfaction feeling of users. Jen-Yin Yeh described in its publication, that the efficiency of an ERP implementation depends to impact employee's feelings, physical needs and psychological states. In his study participants clearly identified that user characteristics like age and capability were clearly issues impacting on user satisfaction. Consequently, the evaluation of an ERP implementation is a more difficult process with many factors and boundaries and the most problem is that the majority of these factors are human factors.

Researchers, who studies ERP evaluation, recognized that quite a few information investment benefits did not get proper assessment. For a corresponding assessment we have to involve a larger number of

factors in evaluation process. Evaluation processes have to be start from goals, which are connection with the ERP introduction. Investigations indicated that the main drivers of enterprise investment ERP system comes from: (1)Improving operational efficiency; (2) Offering a good decision-making supporting system to managers, and improving the decision accuracy; (3) Reducing cost; (4) Obtaining advantages of market competition, and catching up with the competitor; (5) Meeting the requirement of clients;(6) Realizing IT strategy.

In 2007 we have made a questionnaire survey where an important question was where, in what areas of businesses returns of ERP investments could be measured. On the basis of the responses the following order can be set up: time efficiency, strategic advantages, transparency, decreases in stock levels, planability. In the chapter on economic evaluation the ways for quantifying certain factors in the case of a given project is dealt with in more detail.

Keywords: ERP evaluation, economic evaluation, TCO, ROI

Innovation of Enterprise Information Systems with Contribution of the INNO IT Framework

Eva Simkova[1] – Josef Basl[2]

[1,2]*University of Economics, Prague, Czech Republic* [1]*EvaSimkova@email.cz,* [2]*basl@vse.cz*

The paper deals with INNO (acronym for innovation) IT Framework within the context of the in enterprise information systems innovation as a key competitive factor. INNO IT Framework is a process oriented innovation management framework, which results from the university research and has been verified on real business case studies. The goal of this paper is to demonstrate on case studies its contribution to the IS management.

The INNO IT Framework provides a set of well structured processes and is intended as guidance tool for managers and IT practitioners who manage innovation throughout its entire life cycle. The benefits of the framework may be realized by companies IT support to achieve their business goals. This framework is the outcome of a research that has been accomplished as a part of research program funded by the Grant Agency of the Czech Republic GACR 201/08/0663.

Business competitiveness depends to a far larger extent today than in the past on the ability of manufacturing and service sectors to meet fast-changing market needs as quickly and efficiently as possible through the application of new technology or through application of new non-technological innovation, such as service and process oriented frameworks and approaches. This ability to assimilate and apply new knowledge in order to improve productivity and create new products and services relies on scientific inventiveness and entrepreneurial flair. But it is also affected fundamentally by the conditions which permit, encourage and sustain innovative creativity and investment, or those which impede or limit it. In the 21st century, innovation is the primary driver of successful industrial and enterprise policy. To build successful, high-profit and growth focused organization, the entrepreneurs should understand that it is the innovation what drives the competitiveness.

Companies that continuously innovate will create and re-invent new markets, products, services, and business models - which lead to more growth. Booz Allen Hamilton's annual study (2006) of the world's 1,000 largest corporate R&D budgets uncovers the R&D spending on innovation in 2005. Total spending has been 407$Bilion in total, out o which:

– Computing & Electronics $105B (26%)
– Health $87,3B (22%)
– Auto $70,0B (17%)

The distribution of R&D spending by industry reflects the relative size of the industries themselves. R&D expenditure by the Global Innovation 1000 rose 9,8% in 2006, almost twice the growth rate of the previous five years. The 10 largest corporate spenders on R&D in 2006 were: Toyota, Pfizer, Ford, Johnson & Johnson, DaimlerChrysler, General Motors, Microsoft, GlaxoSmithKline, Siemens and IBM. In 2005 Microsoft spent $M 6.184 (16% R&D/sales), IBM $M 5.842 (6% R&D/sales), Intel $M 5.145 (13% R&D/sales). Innovation is the fundamental source of value creation in companies and an important enabler of competitive advantage.

The Challenge of IT in Downturn

Péter Fehér

Corvinus University of Budapest, Department of Information Systems, Hungary
pfeher@informatika.uni-corvinus.hu

As the global financial, now economical crisis showed its face, both people and organizations became scared, and they are continuously overreacting the events, causing more and more trouble. Organizations decide on simple cost cuttings, stop investments, developments, hiring new talents. The question is, whether these actions will increase the efficiency of the organizations, and what will happen, when the crisis is over. Through stopping developments inside, and postponing strategy executions, organizations are not able to enhance their productivity, and while the world is changing, these organizations have no answer to the present and future challenges. Of course organizations should decide wisely where to put the money in these times, but they should consider both short-term and long-term investments.

The pressure of the crisis is also a good opportunity to reconsider the current practice of the organization: Are we doing everything perfectly? In which points can we enhance our practice? Where are the bottlenecks? Are our resources used efficiently and effectively? Each business unit in an enterprise has different requirements on IT support; therefore through the standardization of IT services this unique advantage can be lost. On the provided IT services, and differentiated IT support should be analyzed during the development of the organizational IT strategy. Based on the IT strategy not only the offered service portfolio is provided, but also the further developments are vision and planned. During the strategic review, the analysis of every service is required in order to explore the widely accepted and used solutions. If yes, these services should be transformed into a cost-effective mass-service, and concentrate on other business services with unique IT solutions.

Therefore during the development of the IT service portfolio, every business requirements should be uniquely analyzed. Based on the analysis phase, the IT service portfolio should include both centralized standard services, and unique, innovative services and project for business units. The analysis provides also a good basis for the promising of IT resources. Centralized solutions, based on the IT strategy have importance even in the case of tailor-made solutions through providing a common technological background, infrastructure, guidelines for vendor management, or platforms.

The question is, whether these basic guidelines on using information technology and developing a service portfolio are useable during downturn? Another question is how technology trends and developments in the near future can provide new opportunities for introducing new solutions? The pressure on the IT departments for cost reduction and enhanced efficiency will increase, therefore the question of sourcing solutions (insourcing, outsourcing, co-sourcing, partnerships, KPOs, service centers, etc.) will arise with the expectation of fast solutions.

Planning the IT budget for a year or securing additional resources for development projects was hard every time for CIOs, because the financial background and clear financial benefits of IT developments were

far from clear. In downturn we should see this challenge as an opportunity: CIOs should present the expected results based on hard evidence and facts. The competition for internal resources will increase, and even in radical situations the whole IT budget for development will be erased, and transformed into the part of the budget of business units. Seems to be dangerous, but thinking positively it results a tighter cooperation between IT and business, and new developments will be perceived as business and not as IT projects.

To decide on answers to the crisis, the following few issues worth deeper analysis, considering operational excellence. Surprisingly almost everything seems to be about just cost cutting, but if the topics are more deeply explored, the details show otherwise:

To enhance efficiency and reduce cost: review operational processes

- – Explore, assess and mitigate operational risks
- – Use IT wisely, change user behavior
- – IT Innovation, IT talent management

Keywords: downturn, crisis, value of IT, IT cost, IT budget

Sophisticated Methods to Calculate the Benefit of IT Investments

Erdős Ferenc

Széchenyi István Egyetem, Hungary; eMail: erdosf@sze.hu

Besides cost analysis the benefit analysis is also an essential component of economic calculations, as an IT investment cannot be only judged by its various costs. In case the investment decisions are bound to the prices too much, that company may have consequences which cannot be realized for him, for what the investment does not yield the expected profit as his result. The so wrong investment decisions may be more expensive subsequently, than an alternative appearing costlier initially. The IT decision makers, who handle the informatics system as a black box, they can not be recognized between the single IT solutions many times not insignificant difference.

Due to complicated profit calculations and estimation methods, the benefit of IT projects can be less often numerically forecasted than their costs; moreover, knowing their complicated and complex mode of action the ex-post definition is extremely difficult. Nevertheless, there are also IT investments whose benefit can be relative easily measured. (Such can be for example the creation of a web store.) As the needs and so the aims of the different companies and even the IT projects very much vary, there cannot be an only profit model that is adaptable for all companies. Therefore there is not a generally applicable TBO (Total Benefit of Ownership) model for evaluating the efficiency of the various IT projects in a structured way. Instead of using a unique method there are special procedures that can help to partly monetarize the benefits by IT investments. This paper analyzes some of these special methods. Besides cost analysis the benefit analysis is also an essential component of economic calculations, as an IT investment cannot be only judged by its various costs. In case the investment decisions are bound to the prices too much, that company may have consequences which cannot be realized for him, for what the investment does not yield the expected profit as his result. The so wrong investment decisions may be more expensive subsequently, than an alternative appearing costlier initially. The IT decision makers, who handle the informatics system as a black box, they can not be recognized between the single IT solutions many times not insignificant difference.

The certain quantitative yields of the informatics investments easily can be concretized (hard return), but there are qualitative yields, that can be measured exceptionally difficultly only monetarily (soft return). The next figure shows the possible factors of benefits deriving from IT investments well. By the initial difficulties which can be observed often at the time of the introduction of the informatics systems – the unfair usage of the system, the slipping of the education etc. –the usefulness effects can be realized many times only later,

and in an incomplete measure. To this yet the ex ante type in case of assessments tall insecurity potential is accompanied, since the fruition of the single effects and their measure depend on a row of limit condition. After the introduction of an informatics system, identical scopes of problems arise naturally in case of assessment mid term or ex post.

Keywords: IT investment, benefit, TSTS, HVM

SESSION 6
IT PROFESSIONALISM, EDUCATION

Session Chair: Andrea Ko.

STUDIO - Ontology Driven Learning Environment

Réka Vas[1] – András Gábor[2] – Andrea Kő[3] – Barna Kovács[4]

[1,2,3,4]Corvinus University of Budapest, Hungary; eMails: [1]rvas@informatika.uni-corvinus.hu [2]gabor@informatika.uni-corvinus.hu [3]ko@uni-corvinus.hu [4]bkovacs@informatika.uni-corvinus.hu

As more companies realize that their greatest competitive advantage is their employees and the knowledge that those employees have, e-learning solutions are gaining in popularity. Therefore enterprises turn towards the development and/or application of innovative and modern technologies to meet their diverse training needs. The most innovative e-learning solutions not only enable employees to easily access, understand and apply even complex training materials, but also can be easily integrated with the already existing knowledge management solutions and systems of the organization.

The paper presents a complex ontology driven e-learning environment, that actively support the whole learning cycle, independently from its form (e.g. workstation- or mobile phone-based learning). The STUDIO system is a platform independent learning environment that enables the development of customized qualification programs, based on the individual's pervious qualifications, completed levels, corporate trainings and practical experiences. The potential application areas of this approach are rather wide, both public and business sector can enjoy its benefits. Through its main components – educational ontology, content management system, adaptive testing system, learning management system –, the system is also capable to tackle the challenges of communication, collaboration, content delivery regardless of time and space.

This paper describes the problems and solutions of an ongoing project in the following manner:

– First, the major ideas are introduced, including a detailed description a comprehensive learning environment and its major pillars. The first pillar is a repository layer that plays a key role in content development and management. The other one is an ontology layer that supports the creation of transparent curricula content (Educational Ontology) and the promotion of reliable knowledge testing (Adaptive Knowledge Testing System).

– Next, the experiences gained during business intelligence education and training is demonstrated. The use of business intelligence technologies is high and growing; BI seems to be necessary, but not sufficient for companies' success. Acquisitions done recently revealed, that ERP market considers BI as a strategic direction for expansion (e.g. SAP acquired Business Objects). BI field is changing fast, so the way of its education requires special solutions. We tested STUDIO system's application in BI field at three educational levels: BSc, MSc and in management training. Paper will detail lessons learnt, collected during the trial.

– Finally ideas concerning future development are discussed.

Keywords: e-learning, ontology, adaptive test, content management

Correspondence System of Lifelong Learning, Knowledge Management and E-learning in Everyday Higher Education Practice

Erzsébet Noszkay[1] – Anikó Balogh[2]

[1]*Budapest College of Communication and Business, Hungary; enoszkay@bkf.hu nomenb@t-online.hu*
[2]*Dennis Gabor Applied University, Budapest, Hungary, balogh@gdf.hu*

In these days the expression 'knowledge management' is perhaps the most commonly used term in management literature. Although it is interesting that the management of knowledge and the role of knowledge workers in connection with higher education are mentioned relatively less, though the system of higher education is precisely the place where not only the potentially future knowledge workers are trained but also the place where they are present as professors. Intelligent adult training, which follows contemporary expectations – realization of planned process of lifelong learning – is unimaginable without knowledge management. Companies already handle these issues together within their training plans. Pure knowledge transfer is hardly permissible in business without knowledge sharing and knowledge integration. All these unavoidably result in new knowledge combinations, which add value on the one hand in new products, on the other hand in new, acquirable „knowledge products", representing a higher level of the development spiral. In the first part of the article the above described development process of adult education and knowledge management is described in detail, elaborating on the different levels of e-learning from „learning by interaction", „learning by cooperation" to „learning through information".

Then knowledge management in higher education with the use of a Learning Management System (LMS) is illustrated by a practical example. The introduction of the LMS ILIAS at Dennis Gabor Applied University resulted in a surprising outcome: high demand from students to teacher feedback in the forums. We would even risk the assumption that demands for communication even overshadows the demand for content in certain situations. Introducing the system brought radical changes into university life. Teachers are "forced" to use the LMS on a daily basis answering student questions. The smooth flow of communication is assisted by quality management procedures and documentation. Finally by using the examination results we suggest ways of assigning more suitable e-learning applications to users, especially with the help of experiences in higher education.

Keywords: knowledge society, lifelong learning, knowledge management in higher education, e-learning, knowledge sharing and integration

Comparison of the French and Hungarian Distance Learning Systems of Agro-economical Studies

Mária Bakó[1] – Péter Lengyel[2]

[1,2]*Department of Business and Agricultural Informatics, Centre of Agricultural Sciences and Engineering, University of Debrecen, Hungary; eMails: [1]bakom@unideb.hu [2]lengyel@agr.unideb.hu*

In our fast-changing world the technology of each job is completely replaced within years. The education need to follow this fast changing, the employers need to learn the new methods and tricks of their job. Of course, this is true for the agro-economy, too. Here, the timing of the tasks is determined by the weather, so it is hard to organize the regular education. This is the reason, why the distance learning ideal for the agriculture. The distance learning has many types, and nowadays the favorite from them is the e-learning. In this case the learning material is available by computers, too; and we can use the advantages of the Internet. Namely the student can communicate with the teacher or with each other, and this kind of communication is

very cheap. The student can get answer for their questions within minutes, and the answers of all the questions can be made available for the others. Frequently the other students give answer the questions before the teacher, so the teacher/tutor became the education-organizer and not a knowledge distributor. In the case of e-learning, students are more involved in the learning process than they were involved at pervious methods. The freely organized learning time of e-learning good for the learners, and the less contact hours are better for the institutes in economical sense.

The popularity of the e-learning produced countless programs for administration the education. Many software developer produced programs to manage the educational process, keeps records of evolution of the students. The Faculty of Agricultural Economics and Rural Development at University of Debrecen (UD) have begun to use such software in 2008. We have chosen Moodle, which is very common in Hungary and at abroad, as well. We use this system at regular and correspondent studies, too. We store notes, slides, examples, quiz question and different handouts in this system. Of course at setting up Moodle we considered the experiences from the entire world, to learn from others mistakes and do not repeat them.

In this article we show the experience of the École Supérieure d' Agriculture d' Angers (ESA) and we compare with our practice. This univerity was founded in 1898 to train agrarians, and they have corresponding studies from 1927, which is operate nowadays as distance learning. They introduced their e-learning system in 2005, and they choosed Moodle, as well. In the article we present the distance learning system of ESA, the time-table of the students, the system of consultations, and we compare each of them with the corresponding item at UD.

Keywords: distance learning, corresponding studies, moodle

Intelligent Knowledge Assessment in eLearning

Melinda Krankovits[1] – Árpád Csík[2]

[1,2]*Széchenyi István University, Győr* [1]*kmelinda@sze.hu,* [2]*arpicsik@sze.hu*

Educations based on e-learning technologies are extensively used at the Széchenyi István University. The fully automatic correction of the tests following each educational unit is a very cumbersome task, because students are required to type in their answers. Present state-of-the-art methods merely search for exactly matching words, or synonyms. In the present paper we exploit well-known text mining algorithms for the intelligent automated correction of the students' answers. Test results indicate, that the presented method substantially decreases the number of manual tutor scoring and results in considerably fairer evaluation.

At the Széchenyi István University the e-learning education was established in 2004. Since then thousands of students have been learning the techniques of e-learning solutions, justifying the popularity of this type of education. Our learning management system (in what follows COEDU, coedu.sze.hu) enables to create powerful, flexible online learning experiences. The online courses are divided to lectures which are subdivided to modules. Each modules and lectures are closed by a set of quiz tests. The exam is also an online quiz test, with questions from the following categories: multiple choices, true/false, numerical answer, answer matching, short answer. The present paper is structured into three parts. Following some introductory remarks in the second section we summarize the most important features of the short answer questions, and the scoring methods. In the third section we summarize the basic features of text mining solutions, which are the stemming words and pattern matching algorithm for solving correction problems. In the last section test results are presented.

Keywords: e-learning, test, online test, short answer, text mining, pattern matching, stemming

SESSION 7
SOCIAL ISSUES
RELATED TO THE ENTERPRISE INFORMATION SYSTEMS

Session Chair: Gabor Homonnay

The Twilight of the ERPs?

Gábor Homonnay

CHINOIN Zrt, Member of Sanofi-Aventis Group,Hungary; eMail: gabor.homonnay@sanofi-aventis.com

We all know the eternal desire for ideal business applications. This dream was changing during the years, together with the growth of computer based application systems. Fix element was in this evolution the need for an integrated planning-management-analysis solution of the business entity, legal entity.

Such planning-management-analysis tools now we call ERPs. The first "integrated systems" were i.e. BOMP, DBOMP, COPICS, MAPICS. This is the famous early IBM product line. Other manufacturers also made their first "integrated systems", as i.e. the ICL's PROMPT. The mandatory attributes of "integrated systems" were already present in these applications.

It is interesting that the core of the first integrated systems was the production planning and controlling, the material requirement planning and tracking. They called as MRPs, material requirement planning, later manufacture resource planning – which second has enriched functionality comparing to the material requirement planning.

The developed MRPs started to contain the financial management functions too. The SAP set up the early best sample of the integrated business application designed for all business functions of a company. The ERP was growing up when it came out from the computer center, when the LAN based network applications became general used tools. The module-set is already "standard" that time, even if the options of the functionalities and the flexibility/customization were not the same in different ERPs. The big companies installed their ERPs, it was not only "fashionable" in the eighties-nineties. The ERP was available for small legal entities also. The ROI was acceptable even if an installation of the ERP was (and still is) expensive. ERPs made the companies transparent (in case of a successful implementation), where even an external auditor can understand the business details after some hours of acquaintance.

The picture (seeing the surface) is very attractive, very optimistic. One can see successful application with high level of built-in knowledge and integration-logic. But behind the scene there is the enormous effort of implementation, organization, procedures, operation and maintenance. The early-bird ERPs, the MRPs had the complete documentation in some volumes, some hundreds of pages only. One specialist was able to understand it in all of its details as well. There was not an extreme result to support all modules of an MRP application in details – by a single specialist. We could not imagine this i.e. concerning the complete SAP ERP, concerning all modules of a typical SAP application. One module is a handsome size to support it by the single specialist (and he/she must trust in an always working powerful central support behind him/her). The ERPs became giants.

We have some examples what happened to the giants. We can imagine the twilight of the dinos, we know the story of Roman Empire, the end of great war-ships. Today we can realize the difficulties of large constructions, how vulnerable they are, how difficult is to manage them in case of a catastrophe (fire, earth cake etc.). An other evidence of the giant being is that some of the major failure of IS/IT branch happened to the ERP implementations.

Back to the ERP: we can see recently different external (and provocative) challenges, threats toward ERPs. Other special tools arrived: CRM and companion, which try to push ERP from the complete management of the business back to a simple accounting-controlling functionality. The very specialized tools can overcome the ERPs in their special single domain.

The lecture analyses the various external threats of ERPs, what are the sources of the success of the competitors. Special analysis is concerning SOA, concerning service oriented architecture. What is the role of SOA in context of the ERP? How can ERP and SOA live together with symbiosis?

ERPs have their internal challenges as well. They are coming from the application environment and even from the ERP manufacturers inside. The key success factors of the ERP's implementation should be built into the implementation project. The project plan generally contains them. Why the key success factors are missing finally?

ERP manufacturers also have challenges. How can they make more profit on a diminishing market? How can they maintain their product in the very changing IS/IT environment? How can they make ERP user friendly and easy to use? High level of knowledge is necessary for an ERP usage, from the user side and from the supporting side also. What is the role of the education concerning ERP? What to train to the students?

We can see heavy difficulties. Is the mission of the ERPs ended? Should they go back to the Walhalla? Or will their role be reduced? Or they are punished for an endless story?

Keywords: ERP, business integration, controls, SOA (Service Oriented Architecture)

The Characteristics of Researches of Enterprise Information Systems in the Social Context of Japan

Tetsuya Uchiki

Graduate School of Cultural Science, Saitama University, Japan; eMail: uchiki@kyy.saitama-u.ac.jp

Enterprise Information Systems (EIS) relate to not only functionality and availability of computer systems for the businesses but also a human system in the firms including with their practical operations, consistency with the enterprise culture, and consciousness of individual workers. Because of that, harmony between functional mechanisms of computer systems and the related human system's matters is needed in the design of EIS. Also it is important to keep harmonizing for activating EIS but we can not keep harmony easily without many adjustments among the related human system's matters in every moment because it arises on the delicate balance of them. Then many approaches and methodologies to design EIS that can build and keep the balance easily have been developed.

In Japan, however, neither the argument of design methodologies nor academic researches of EIS have been grappled with actively. The main reason is that most of researchers and practitioners consider that an enterprise information system is only a computerized information processing system. And they have considered that the harmony of the related matters around the computerized system was only the know-how or the tacit knowledge in the social contexts of the practical works. In many Japanese firms, the reforming of organization and the re-engineering of business processes indispensable to activate EIS are often achieved after the introducing of new information processing systems. And many of the information processing systems have been even modified so as to fit to the current business processes. Nevertheless, the problems of EIS have not been approached from viewpoint of social sciences, and the values of many approaches have not been recognized.

Actually, there is no specialty of information systems in most of Japanese MBA schools. It means that they are the situation that neither a businessperson nor a researcher is raised. Therefore only engineers have approached to solve many problems of EIS by information processing technologies in Japan. As well, it seems that most of the practitioners in Japan have considered that the problems of EIS should be solved technologically. From the same viewpoint, we researchers have thought that we have to inform and to enlighten these practitioners about our research findings of EIS more and more. On the other hand, however, we are also able

to consider that the situation is led from peculiar phenomena in the Japanese social context and particular culture of Japanese firms. And now we believe that this framework concerned with social context is the right way to find out the reason why the researches of EIS are not thought important in Japan.

In this paper we introduce a dynamic relation model to realize a mutual balance with the related indispensable matters to activate EIS based on this framework. And we propose the dynamic relation model of EIS in Japanese firms based on our participative observation. We refer to the relation with the present situation of EIS researches in Japan explaining the characteristics of dynamic relationship in Japanese firms by using this model. First, we classified the viewpoints of evaluation of information systems into the four paradigms using the sociological paradigms proposed by G. Burrell & G. Morgan in order to understand the relationship between the situation of EIS and the social context. One of the two axes is assigned as the differences of the positions to an information system, and has classified the designers and developers of EIS as subjective side and the end-users of EIS as objective side. The other axis is assigned as the differences of the viewpoint of the effectiveness of EIS, and has classified the thought that the order between users becomes strong as regulation, and the thought that brings conflicts between users as the radical change. These viewpoints of evaluation show that an EIS has to be designed as technological solution in consideration of the balance among social constraints, a norm, and user consciousness. And in the operation and the maintenance of EIS, it is important to keep the balance of them. They relate mutually and the relation between a technological system and users and the social context dependent on culture and social structure relate indirectly. Furthermore, the relation even includes a time lag. Therefore, we should represent a direct relationship of technological system and the social context as a relation between different dimensions. A well-designed computerized information processing system is a stage that can activate user's motivation and increase their activity. And the EIS formed by them can be considered to be existence like a comfortable workspace for users. The design and development methodologies and researches of EIS are giving the policy and the way to realize the harmony between a human being and society in the first stage, and also to keep and to maintain this harmony.

In contrast in Japan, the problems of EIS are generally recognized as only technological problems, and the technological solutions of them are required. The conformity between the business processes of firms using computerized system and the user's skill is important naturally. In many case in Japan, however, it is considered that the problems have been caused by only the mismatch between each user's skill and the interface of technological system. It seems that it can be coped with as a problem that optimizes the way of work there because a technical system is received as new business environment or process in the firm. Therefore, there are few arguments from the viewpoint of management of regarding a society as a system. There is no grand design of the EIS to activate the essential functions of the business process or the technological system, or it is hardly thought as important. We are able to find the similar cases in the design and development of EIS. In these cases, only the functional efficiency of a machine system is the main purpose, and neither the business process nor the organization is reconstructed, and it is brought new workload more than efficiency of business process, and the worker's busyness is also increasing. Because those organizations are continuing functioning in spite of such a situation, the problems do not become clear in many cases. The spread of new information technologies and the situation of systems development in Japan are very unique, and the situation is similar to "Galapagos Islands". Now we believe that different viewpoints from foreign countries and other cultures are just a key that clarifies essence of the information system problems. Also we think about the dynamic relations among these independent factors mutuality who tends to be overlooked during the operation of EIS. Finally, we discuss the characteristics of EIS researches in Japan based on the dynamic relations between the factors.

Keywords: Enterprise Information Systems, Social Context, Information System Design, Qualitative Research

Existing Business Challenges
of Information Communication Technologies

András Nemeslaki[1] – Paola Bielli[2]

[1]Associate Professor, Head of the E-business Research Center Corvinus University of Budapest, Hungary; andras.nemeslaki@uni-corvinus.hu [2]Associate Professor of Information Systems University of Bocconi, Milan, Italy, paola.bielli@unibocconi.it

Do information and communication technologies (ICT) matter? This question has become the big issue around which managers debate the value of ICT. Nicholas Carr in his famous 2003 Harvard Business Review paper stated that the sun is setting on information technologies as a source of strategic weapons and they are no longer the source of competitive advantage. He suggests that ICT is becoming a utility, like electricity: simply plug into a grid and source it at the lowest cost. Yet in most everyday experience, we face a huge difficulty in getting oriented in this "seamless" digital infrastructure; day by day managers have to make decisions that have implications on ICT budgets or are constrained by the limitations of technology, regardless of the ambitious plans of marketers and visionary strategists.

In tandem with the sceptism of ICT´s strategic relevance from the practical point of view there are also academic dilemmas; an "identity crisis" within the information systems discipline, as we can read it for instance in several MISQ papers. The scholarship in the realm of ICT is incredibly diverse; topics range from infrastructure to business solutions and the consequences of these such as planning, building, adopting, controlling, supporting, and so forth. Recognizing, that the information-systems discipline has to define and determine proper boundaries, scholars can really make high-value and high-impact contributions to academia, and also to enterprises, if they look at ICT as the "glue" that binds enterprise processes together, thereby impacting stakeholders and every aspect of organizational life.

In our paper we look at the challenges and managerial implications of ICT on organizations. The findings are a summary of the working sessions of the CEMS Faculty Group in Enterprise Networking and ICT together with the Doctoral Consortium of NITIM[2], held at the University of St. Gallen 2007 and at the University of Leiden in 2008.

The first identified issue is the value challenge, which focuses on the managerial challenges of how to determine the value of ICT on business performance, which is rooted in the second challenge area, the problem of business models. Business models are the complex relationships of business processes with the corporate stakeholders and organizational units is. From the technology point of view these models are supported by a complex infrastructure: internet, intranet, extranet, wireless networks, servers, gateways, firewalls, telecommunication devices, portals, databases, application software packages, all of which have unique suppliers and highly specialized knowledge domains to manage and control.

The third area which we have identified is the ICT adoption challenge. Usage of technology and adoption patterns are driven by social trends, demographics and even fashion, as well as economic reality. We all like to be empowered by the use of technology in our personal lives and simply expect the same in our working environments. There is a sharp contrast between consumer types of opportunities and the controlled and logical environment of the enterprise, where technology is still viewed as an asset to be evaluated, measured and deployed in an atmosphere of financially responsible accountability. Technology-literate users are accustomed to easy network access and regard ubiquitous 24/7 access as a mere "tool of the trade." They

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[2] NITIM: Networks Innovation Technology Information Management which is a Ph.D. Consortium organized by CETIM at the University of Leiden.

want some say in the choice of devices they carry around and expect to perform both personal and work tasks from the same device. However, this has become an intolerable burden to IT departments.

Fourthly, we look into the technology innovation challenge. Innovation and entepreneurship is a key driver for ICT development. Pioneering in an industry is considered to be the most future-orientated move among all activities for a company and therefore the heaviest booster of long-term economic growth. The fifth problem area which is especially connected to innovation is what we called as the networking challenge. The creation of the links between companies, individuals requires serious cooperation, and these connections are supposed to complete a company's network system based on economic interest, the significance of which has been getting higher and higher lately. Regarding the organization itself, its network is one of the most endogenous factors in the innovation process.

Finally, we discuss some of the social responsibility challenges regarding ICT. We emphasize the human resource issues, the importance of change management and the stakeholder relationship. During the next decade Generation Y will be joined at workplaces by the Millennium Generation and this will create a white-collar labor force with the highest digital-technology literacy of our ages. In both Europe and the US the naturally reproduced population is decreasing while life expectancy increases. By 2050 there will be more people in the world older than 60 than younger than 15 for first time in human history. This has serious implications on healthcare systems, pension systems, and immigration systems as well. It cannot be neglected that ICT applications have their "globalization" effect; for instance, they consume more and more energy. According to recent research at the Berkeley National Laboratory, aggregate electricity use for servers doubled between 2000 and 2005 both in the USA and worldwide. It seems that the future bottleneck for e-readiness will not be bandwidth or connectivity but the source of energy to run servers, routers and infrastructure devices.

Keywords: information communication technologies, business model, networking, technology adoption, innovation

How Embodied Conversational Agents (ECA) affect Customer Trust in a Service Enviroment?

Klara Kövesi[1] – François Habbouche[2]

[1]*University of Bretagne Occidental, France; eMail : klara.kovesi@univ-brest.fr*
[2]*OrangeLabs, France; eMail: farid.habbouche@orange-ftgroup.com*

The purpose of this study is to investigate the influence of the introduction of Embodied Conversational Agents (ECA) on online customer trust in a service environment. We examine perceived customer trust in two contexts of consumption: one related to the use of online services (by the evaluation of the usability and the design of a service) and the other one related to the communication (by evaluating the information transmission and the quality of the relationship with the client). This issue will be addressed here in terms of three functions of the ECA: hosting the visitor, submitting tenders and archiving of conversations. Moreover, the impact of the presence or absence of the virtual agent on the perceived trust of the customer was measured. The results show that the use of ECA increases the perceived customer trust level. Introducing ECA leads to a better quality of care with a higher level of benevolence and a better reliability of the site which contributes to its reputation.

Application of ECA is considered nowadays as a good tool for establishing online service customer relationship. In a competitive context, these agents play an important part in the development of this relationship. Customer trust in a virtual agent has a capital importance in generating transaction and in maintaining the continuity of the relation. It represents many interests for customer: allows reducing transaction costs, risks and uncertainties, and helps to preserve relational investment. However, online service customer trust

includes specific features because of the nature of the relationship between partners. In the context of online environment, service customer must have trust not only in his partner but also in the technology that appears to be an additional item of trust. Compared to traditional transactions, the online service costumer generally has a weaker relationship with his service encounter due to the lack of interpersonal contact that gets the relation anonymous and automated and makes more difficult to develop customer trust.

The application of virtual agents in an online service environment is useful for reducing information overload, providing recommendation and facilitating customer decision making. In this situation, the virtual agent acts a similar way as a salesperson in a physical store and fulfils the same functions but without a wide range of humane interaction. Nevertheless, according to the literature, the development of the trust to a physical person is quite different from the trust to a virtual agent.

Given this difference, it seems to be interesting to investigate the role of virtual agents on the development of online customer trust in an interactive environment (Hassanein and Head, 2004). The central theme of this paper is to understand how an application of ECA influences on customer trust perception in the order to ameliorate user interfaces. In other words, what dimension of service customer trust can be impacted with ECA?

Keywords: Embodied Conversational Agent (ECA), trust, online services

SESSION 8
PRACTICAL ISSUES OF THE ERPS

Session Chairs: V. Balakrishnan, Rogerio Carvalho, Andrew Stein

Analysis of Critical Problems in ERP Implementation to Enhance Service Oriented Architecture for Energy & Utilities – A Case Study

V. Balakrishnan[1] – Aurobi Das[2]

[1]Anna University, Coimbatore, India; eMail: research_job@hotmail.com [2]Computer Science & Management Studies - IIIT, India; eMail: dauroin@gmail.com

Enterprise Resource Planning (ERP) software helps integrate management, staff, and equipment, combining all aspects of the business into one system in order to facilitate every element of the manufacturing process. ERP groups traditional company and management functions (such as accounting, human resources, manufacturing management, and customer relationship management) into a coherent whole. Manufacturing management also includes inventory, purchasing, and quality and sales management. ERP systems aid in the control and communication of business activities, such as efficient handling of order processing and production scheduling, management and analyses of business processes within an interactive environment, synchronization of departmental activities (e.g., within human resources or finances) with the needs and output from production facilities monitoring, sharing, and tracking of information throughout the organization.

Some of the major problems encountered while implementing ERP are as the cost is likely to be underestimated, the time and effort to implement are likely to be underestimated, the resources from both the business and IT are likely to higher than anticipated, the level of outside expertise required will be higher than anticipated, the changes required to business processes will be higher than expected, scope control will be more difficult than expected, there will never be enough training, particularly across different modules. The first problem organizations must face is the reasons for implementing an ERP system. This investment should, as any other investment, aim for profitability. This might seem obvious, but it doesn't seem to be clear for many companies. They want staff reductions, more control, or more automation, but they don't prioritize *return on investment* (ROI). Many times there are no staff reductions after the   implementation process, so some companies assume that the project failed, or employees in some areas have more work to do, so to them, the project is not producing any results. In the end, if the company reduces its operation costs, improves its service level, increases its sales, and finally, increases its revenue, the project is considered a success.

This paper analyzed the critical problems faced during ERP implementation which has been based on the reviews of various research papers as well as industry specific case-studies. The major problems areas of ERP implementation are categorized here. Simultaneously this paper illustrated the ways the critical problem areas has been handled by the SAP Software of ERP to overcome the critical failure factors during ERP implementation to make the ERP a successful most efficient businesses process in industry. Specifically cases of SAP-SOA architecture has been illustrated with criticalities of its implementation in Energy and Utilities.

Keywords: Enterprise Resource Planning, Systems Application Products in Data Processing, Service Oriented Architecture, Energy Service Companies

ERPs in Digital Business Ecosystem

Miklós Herdon[1]– Tünde Rózsa[2]– Ádám Péntek[3]

[1,2,3]*University of Debrecen, Hungary; eMails: [1]herdon@agr.unideb.hu, [2]rozsat@agr.unideb.hu, [3]Adam.Pentek@agr.unideb.hu*

Businesses are a highly interconnected network of companies, organisations, technologies, consumers, products and services today. The Digital Business Ecosystem (DBE) is the enabling technology for the business ecosystems. The concept of DBE has been coined initially in 2002 in Europe. Today the European vision of Digital Ecosystems is becoming mature ant currently there are more important related projects ongoing in Europe. The conception of the Digital Business Ecosystem (DBE) has come to build an Internet-based environment in which businesses will be able to interact with each other efficiently. In the near future when this platform will be realized going to allow Small and Medium Enterprises (SMEs) to compete in the market with the same chance, independently of size and distance from the city, are their business. The DBE is supported by the new hardware and software technologies, network topologies. The Open Source and component-based software, the collaborative environment, development and the popular and quick developing network technologies can establish the extensive use of DBE.

In a Digital Ecosystem, a leadership structure may be formed in response to the dynamic needs of the environment. An agent in a Digital Ecosystem can be a client and a server at the same time. In the same message, agents may offer a service to others as a Server and request help as a Client. There is no centralized control structure or fixed role assignment. There is no preconfigured global architecture, where the communication and collaboration is based on swarm intelligence: Unlike traditional environments, digital ecosystems are self-organizing systems which can form different architectural models through swarm intelligence, where local interactions between agents determine the global behavior. Occasionally, intelligent agents or entire species may configure into a hierarchical organization where the communication channels are defined with a leading agent.

Industries have their own systems that are not yet a business ecosystem. A business ecosystem transfers the business strategies from a single co-work to synergic and systematic cooperation (the first characteristic), from product competition to platform competition (the second characteristic), and from single growth to co-evolution (the third characteristic).

Digital ecosystems rely on a technological infrastructure to mediate the formalisation of knowledge in SME networks, the creation of software services, and the B2B interactions between the SMEs. The realisation has by now become commonplace and in fact provided the initial motivation for CRM, SRM and ERP systems.

With our prototype solution the SMEs can provide a safety, transparent, direct services for potential customer. According to the Client-Server architecture, all data are stored on a dedicated server. It could provide huge advantages for the server's owner. Our vision is based on P2P an SOA technology and all components are written with Open Source tools.

Keywords: business ecosystem - enterprise information systems - SME

Incorporating Business Process Change in Information System Design

Yasar Mehmood[1] – Awais Majeed [2]

[1,2]*Department of Computer Science, College of Telecommunications Engineering, National University of Science & Technology (NUST), Pakistan; [1]yasar.mehmood@mcs.edu.pk [2]awais.majeed@mcs.edu.pk*

Market threats, opportunities, changes to regulations and various quality improvement programs are the main drivers of change in an organization's business processes. Considering the frequency of business process re-engineering in today's competitive world, the resulting maintenance of the supporting information systems becomes difficult. There are number of business-rule oriented techniques to handle this problem. There are also process-oriented techniques that take process models as input and enact that process but there is a lack of techniques that can link the process model to the corresponding IS design for better change management. Current work proposes an approach named BP2SD (Business Process to Software Design) that can help in the propagation of the changes in the process model to the software design. Our approach focuses on an integrated framework to support the development of business process model and proposes a methodology that links the process model to the corresponding software design. The methodology also suggests techniques that can be used to propagate the changes made to process model to the corresponding software design elements.

Organizations have made gigantic achievements merely by efficiently improving their processes. Considering the frequency of business process re-engineering in today's competitive world, the maintenance of the supporting information system has become very difficult. There has been a strong desire for efficient techniques to deal with the problem of evolving software. Some of the existing techniques separate the volatile part of the software from the relatively non-volatile part. The aim of such techniques is to isolate the non-volatile parts of the software from volatile part that needs to be modified frequently. Other techniques link the volatile part of the business to the design of information system so that whenever there is change in business requirements the software design is automatically changed according the requirements. There is yet another technique that takes the requirements in the form of process model and run them automatically.

Work has already been done on business rule oriented software evolution. One such technique named link model links business rules to the software design elements in such a way that whenever a business rule is changed, the linked design elements change accordingly. Based on this, the proposed technique BP2SD aims to link the process model to the software design so that any change in the process model is propagated to the linked software design element. For this purpose, a modeling framework is developed to model business processes. Modeling techniques used for this purpose provide ease of use for non-technical users at one hand and provide formalism and ontological completeness at the other to support software design linking. Linking elements are introduced similar to the rule phrases proposed in the link model that act as building blocks for the process model and are linked to some software design elements. UML was chosen as the language to represent software design as it is the standard. In the peper various approaches towards software evolution are described; the section 3 describes the BP2SD approach and section 4 presents a case study to demonstrate the practicability of the approach. Finally, section 5 presents conclusion and future works.

Keywords: Software evolution, Business Process Modeling, Software Design

Decoupling the IT Value-Chain:
The Role of Enterprise Systems in Managing Business Processes

Charles Møller

Aalborg University, Denmark; eMail: charles@production.aau.dk

In the recent years the technologies and the architecture of Enterprise Systems (ES) have undergone a drastic change. Vendors like SAP, Oracle and Microsoft have spent considerable resources on reorganizing their offering towards more being flexible platforms. Simultaneously companies have embarked on various Business Process Management (BPM) initiatives. This paper analyzes the role of contemporary Enterprise Systems in managing business processes. This is studied through an analysis of the emerging ES architectures in four recent cases of BPM adoption in large enterprises. The cases are analyzed using an IT-based value chain framework. The cross case analysis suggest that a stable pattern emerges and the new role of ES in managing business processes is discussed. The paper suggests that two important architectural structures emerge and it is proposed that the management of these structures is a central key to BPM.

In a hyper-competitive environment, continuous innovation is the key to successful business. Innovation usually entails either new products or services for the market, or it encompasses new business models. Less attention has been paid to operational excellence or process innovation. This addresses the need we are facing for frequent change in response to market conditions and new technology. It puts great emphasis on the importance of organizing and managing process innovation for business agility.

In his book "The Agenda", Michael Hammer argues that a prerequisite for focusing on the customer is to have excellent business processes. This is also the essence of older process management concepts such as Total Quality Management or TQM. The new challenge is that today, most global business processes are hard-wired by IT systems, and this makes customer-focused processes difficult to develop and sustain. In his article "Competing on analytics", Tom Davenport discusses the value of analytics. He argues that companies that are able to collect data on their customers, and are then able to analyze this data and act upon this knowledge are able to make a considerable difference in the market. This requires a set of analytical tools, but it also requires the ability to rapidly change the business practices — meaning it requires agile business processes. This, in turn, requires very flexible information systems and new organizational competencies.

In recent years, the developments in enterprise architecture have lead to new insight into how an organization may organize their IT resources so that an agile business process and stable infrastructure create synergy. However Enterprise Information Systems (EIS) such as ERP systems are notorious for *not* being flexible. Consequently, many corporations are looking towards new adaptive approaches to gain and sustain operational excellence.

For these reasons, some companies choose to adopt Business Process Management (BPM). According to Schurter (2006): "BPM is a natural and holistic management approach to operating a business that produces a highly efficient, agile, innovative, and adaptive organization that far exceeds what can be achieved through traditional management approaches". In this paper, we use BPM to denote "a management discipline referring to the integrated and continuous analysis, design, implementation, execution, and monitoring of business processes to increase effectiveness and efficiency with respect to the corporate strategy." BPM is concerned with creating and managing agile business processes, and it is neither a new idea nor a shortcut to quick gains. It is a long-term strategic initiative that requires a persistent effort; however, this endeavor promise to deliver sustainable business value. Fingar and Bellini (2004) claim that a new business paradigm is emerging. They call it the Real-Time Enterprise (RTE): The ideal vision of the RTE is an organization where information moves without hindrance, and business processes are continuously monitored and trigger rapid reactions, usually automated according to embedded business rules.

Information Technology and Systems is considered a main driver of RTE, and the emergence of new technology is also the reason why BPM is on the agenda today in most large corporations. BPM relies on a set of enabling technologies such as business process modeling tools, process execution and monitoring tools, and process integration tools. All of these tools add up to a specific type of software called a business process management suite (BPM suite). A BPM suite can be defined as an integrated collection of critical

software technologies that enables the explicit management of business processes across the process life cycle. This is also referred to as BPM systems or BPMS.

However, the most important technological principle in BPM is the decoupling of the business process from its underlying technical infrastructure. The emergence of process-aware information technology is as important to business as was the emergence of the relational database management system (Dumas et al. 2005). The impact of the database technology was that data was decoupled from the application, and that database operations could be executed on a standardized platform. Today, we are witness to the same development with business processes. The process model thus becomes the interface between business and technology.

This decoupling is best accomplished using explicit and executable models. Today this often implies service-oriented architecture (SOA). SOA is a principle where discrete functions are packaged into a modular and reusable service that can be consumed in a loosely coupled manner. It is important to note that BPM does not require a specific IT platform per se — in fact, BPM can be implemented without any specific IT tool. However, as commercially available EIS are becoming much more mature, the benefits of using these tools have become eminent. Consequently, this is an emerging research area in the architectural impact of BPM and EIS, which is a central question here.

Keywords: Enterprise Information Systems, Business Process Management, Architecture

Using Design Patterns for Creating Highly Flexible ERP Systems

Rogerio Atem de Carvalho[1] – Rafael Manhaes Monnerat[2]

[1]*Instituto Federal Fluminense, Brazil, ratem@iff.edu.br* [2]*Nexedi SARL, France, rafael@nexedi.com*

The most prominent kind of EIS is undoubtedly Enterprise Resources Planning (ERP), a kind of software that is under scrutiny since the last decade. Typically, ERPs are built on top of a framework used to build a set of integrated modules, such as Accounting, Production Planning, Logistics etc. Although these modules represent the so-called best practices – and as such should be used as is by everyone in a given business segment, it is usual to adapt them to the business culture and environment of each adopter organization. However, customizing an ERP is not an easy task, given that on one hand users demand highly integrated business processes – meaning highly integrated system modules; on the other, the development framework must promote loose coupling for the sake of rapid adaptation to disparate requirements. Unfortunately, in the ERP arena, most of academic and industry papers focus on system deployment and management issues, while discussion on design and programming techniques is rather deficient. In fact, proprietary ERPs (P-ERP) documentation at most focuses on API programming, while keeping core design strategies in secret. However, understanding how an ERP core is implemented helps researchers and developers to understand how a flexible EIS code base, built on top of components that can work integrated, can be constructed so that adaptation for different business environments can be made in fast and cheap terms. Aiming to help filling this gap, this paper presents the design patterns used to develop and customize ERP5, a free/open source ERP (FOS-ERP), showing how they are used to provide a very flexible framework for EIS development, while giving guidance on the use of these patterns in other systems. The paper is organized as follows: an introduction presenting the focus of the paper; a description of ERP5's main concepts; a description on how design patterns are composed into ERP5 core, with considerations on their use in other systems; a comparison with related academic work, and finally conclusions.

Keywords: Design Patterns, Business Patterns, Architectural Patterns, Enterprise

The Application of Dashboards and Scorecards for Visualization of Reports and CRM Indicators in the Electric Power System

Imre Petkovic[1] – Ármin Petkovic[2]

[1]*The Faculty of Economics, Subotica, Serbia, peti@eccf.su.ac.yu*   [2]*Budapest University of Technology and Economics, Budapest, Hungary, petkovicsarmin@gmail.com*

Electric power activity represents a specific branch of service activities where one or more users can exert infulence on the quality of rendered services for the other service users (contaminate the network where the influence is an undesired occurence of the third and fifth harmonics). This and all the other CRM characteristics of substantial importance are very necessary for the enterprise management. The key characteristics of business performance are decisive for managers wishing increasingly to see all these indicators on one display. These requirements are satisfied by dashboards and scorecards, which represent the theme of this work. Besides, this work includes the projected dashboard to review technical parameters for functioning the electric power enterprise, as well as the scoreboard for tracking indicators of business performance for some accounting period (quarter, year).

Electric power enterprises must take care of the distribution of electric power, security in providing the quality of electric power, tracking consumption, accounting, payment, as well as energy consumption management. Of all energy distributors, electric power system enterprises have the biggest number of consumers, and the longest and the branchiest network. It is known fact that requirements for electric power change very dynamically (annual increase amounts to 10-15%). At the same time, electric energy is specific because it cannot be accumulated and stored. Electric energy being spent must be charged by generators permanently and directly after spending. The aggregate power of all generators in a national network is limited, disregarding to its capacity. There are temporal intervals when electric power requirements are so expressed that generators are not able to service all consumers. It causes restrictions in rendering electric power. However, it would be desirable that electric power enterprises can manage independently the flows of electric power delivery, in the territory they cover, especially in cases when there is electric power surplus. For that purpose, it is necessary to know well all dimensions of consumers' behavior and needs; anticipate their future activities in order to meet their requirements and increase own profit.

Income increase of electric power enterprises is closely connected with the payment of electric energy, and it directly depends on consumers, i.e. electric energy consumers. It is necessary to familiarize themselves with consumers, tracking them. Their needs require a new paradigm to function the enterprise and it must permeate its whole functioning. It understands the way of behavior of the window staff, workers in maintaining and spreading electric power network, acquisition, tracking, data processing and storing, about quantity, quality and dynamics of delivered electric power to their purchasers (consumers of all categories). It also means the new knowledge about requirements and trends of consumers' needs based on collection of historical data on all forms of business activities. Such a change in philosophy of the enterprise can result in introducing new forms of strategy in consumer relation management

Keywords: Dashboards, Scorecards, Electric Power System

Current Challenges of IT Service Management in Hungary

Zoltán Szabó[1] – Péter Fehér[2]

[1,2]Corvinus University of Budapest, Department of Information Systems, Hungary; [1]szabo@informat-ika.uni-corvinus.hu [2]pfeher@informatika.uni-corvinus.hu

Crucial importance of information technology service management (ITSM) cannot be questioned in the last few decades. ITSM methodologies and standards, especially ITIL (IT Infrastructure Library) have recently become a very popular approach and a widely used methodology to improve this organizational activity. ITIL as a comprehensive approach to manage IT services is based on best-practices. In the international IT literature numerous practical ITIL guidelines, case studies, connectional papers have been published. Though these topics are popular within the IT consulting domain, little, if any research activity has been focused on this topic in Hungary. In the context of the economic crisis the question remains whether Hungarian organizations have understood these possibilities, and if they have so, to what extent they are able to realize ITIL-based innovations.

Based on a recent survey our intention with this article is to investigate the following issues:

– the role of IT in competitiveness and innovation;
– the actual activities in IT strategy planning;
– the characteristics of IT infrastructure and applications;
– the actual and planned state of IT service management;
– the IT budget and the role of IT in the financial planning;

Considering information technology as a factor of the organisational performance and competitiveness, the research analyses the innovative function of IT departments, and the uniqueness of IT solutions. It is as long-lasting challenge of information technology, how to align its activities with the business, and how can an IT department offer valuable, and innovative solutions for the business side. The challenge is that the language, perception and understanding are different in the various business, and even in IT units. The practice of judging information technology is rather different, starting with the perception of traditional cost centres, trusted suppliers to reaching the innovative partner position.

IT strategy is a tool for converting organisational strategy and goals into operational understanding of IT goals and development projects. There is a dynamic relationship between IT strategy and organisational strategy: while the organisational strategy leads the way, sets priorities, and creates demands for information technology, IT trends and IT solutions can offer innovative business models, including new pricing methods, market segmentation, or new distribution channels. The research aimed to analyse the existence and content of IT strategies, and the relationship with organisational strategies.

The processes and activities of IT departments should be based the IT strategy, but also heavily depends on the required services (number and content), complexity of IT environment, number of users and the size of the infrastructure. The research analyses these characteristics, and compares to the existing IT processes and functions. The research focuses on quasi standard ITIL v3 processes and functions, although these processes can be matched with MOF or eSCM processes or areas.

The size of IT budget, related to the revenue of organisations varies between 3-5%, but related to this average the actual practice of the unique organisations in different industries can be rather different (e.g in the pharmaceutical industry this rate is 3,61%). In the case of innovative organisations this rate can even reach 10%, while in the case of conservative organisations this rate in only 0,5-1%. Another experience is that the total budget spent for information technology is 2 or 3 times higher than the IT budget, because beside the IT departments other organisational units perform also IT investments (although, probably this project are not considered as IT investments, officially). These investments are procurements of new devices, tools, or acquiring external IT services. Another question is, how the IT budget is split between operations and development, and what is the rate of external services in this budget.

Keywords: IT budget, ITIL, IT service management, IT strategy, role of IT

BX Test Script Executor for SAP Business One

Miklos Nemeth

Variatech Consulting Ltd., Hungary; eMail: nemeth.miklos@variatech-consulting.hu

A major challenge in software development is to maintain the quality of a piece of software while parts of the software are being extended or improved. A very common situation is when a bug has been fixed and another two bugs have been created along with the bug-fixing job. The only way to reduce these cases is to fully retest the application again and again after each, even after the slightest, modifications or rebuild. This repetitive job is cumbersome and a hard job to solve in every software development project.

Writing an add-on for SAP Business One belongs exactly in this category. SAP Business One add-ons may be quite complex. The BX add-ons are complex to maintain their quality up to a consistent level. Each BX add-on is accompanied by a set of test scripts that may be automatically executed by the BX Test Script Executor with a single button press whenever needed. The results of the tests are written into a log file. In case of a failure in the run of the test scripts, the test script executor stops with an error message. The test scripts for a BX add-on are executed before a new release of the add-on. The test script set may contain hundreds of test scripts, the execution of which taking hours.

A test script is an XML-formatted text file containing a sequence of commands. The possible commands are formally defined in BxTestScript.xsd. In the following sections of the chapter each command is explained and samples are provided how to use them.

Merging Corporate Enterprise Systems

Andrew Stein[1] – Paul Hawking[2]

[1,2]*School of Management & Information Systems, Victoria University of Technology, Australia* [1]*Andrew.stein@vu.edu.au* [2]*Paul.Hawking@vu.edu.au*

The merging, acquiring or consolidation of business entities can be a complicated and daunting task. It could involve two, three or more entities merging, a national or international acquisition or a consolidation of a parent entity with sub-entities. Many companies involved in mergers, acquisitions or consolidations face the challenge of what to do with the 2 or more different IT systems supporting the merging businesses. The potential of merging incompatible software applications is an issue for all large companies, because they all rely on a variety of wide-ranging enterprise applications that must communicate. This paper presents an analysis of the literature of merging corporate enterprise systems and culminates in the presentation of a large scale "greenfields" ERP adoption. The analysis will look at how implementation issues impact in large system mergers.

Many issues arise when companies go down the merger, acquisition or consolidation path: business strategy, competitive positioning, organisational goals, management philosophy, prevailing culture, people retention and technical backbone. Labbe (2001) commented on the difficulty that large organisations with ERP's are having in the current merge environment:

> With its "one company, one system" mantra companies are finding that, even if they buy another company that has the same ERP system, the two are notoriously difficult to put together.

Labbe went further and described two basic approaches to the dilemma of software and systems merger. Some will put the software and systems of the parent in place at the new acquisition with the idea to keep information technology within a single software family that speaks a common computer language. Other merging companies will keep the applications that come with their acquisitions. In these cases, they will install higher-level, over-arching systems that collect data and consolidate vital operations that need to be handled at a corporate level such as accounting software needed to track financial performance. Even when those solutions are from the same vendor, their implementations and customizations are typically so unique and customized as to make them as different as systems from different providers. The challenges facing mergers of Enterprise Resource Planning systems (ERPs) tend to be more organizational than technical and up to 75% of the integration effort during a merger or acquisition is tied up in determining which systems to keep, what data is important and how much integration is actually needed before the companies are technically joined. This paper outlines the findings of a research project that looked at the interplay between merging organisations and their information systems. An analysis of the Fonterra mega merger is presented and studied within the context of an information system merge model.

Keywords: Mergers, Implementation, SAP

Globalization and Electronic Commerce Development in the Republic of Serbia

Jelena Končar[1] – Zita Katai Petrović[2] – Goran Vukmirović[3]

[1,2,3]*Faculty of Economics, Subotica, Serbia; eMails:* [1]*jkoncar@eccf.su.ac.yu* [2]*kzita@eccf.su.ac.yu* [3]*gvukmirovic @eccf.su.ac.yu*

Electronic commerce is a revolutionary and contemporary way of doing trade activities. It is based on the use of information and communication technologies. In contemporary business conditions, trade faces numerous changes, which are mostly the result of market globalization, as well as information technology development. The basic task of Serbian companies understands the need of tracking all the changes in the business environment on the global market with a view to meet consumers' requirements and needs.

Today, the Republic of Serbia is in the initial phase of setting conditions and institutions for electronic commerce development. Contrary to the trend in developed countries, electronic business and electronic commerce have not been followed in an adequate way. To develop electronic commerce in Serbia in a fast and adequate way, it is necessary to identify chances and risks in the business environment of trade organizations. For that purpose, the basic task of organizations is to track changes in the turbulent business environment paying special attention to market globalization, recognizing consumers' needs and requirements, as well as experiences of developed countries. On the other hand, to develop electronic commerce in Serbia, the institutional framework represents a substantial prerequisite, which reduces business risk in this field.

The Republic of Serbia still lags in technology and information science in relation to developed European countries. The previous several years have witnessed the significant development of electronic commerce in the Republic of Serbia. These facts are justified by data on the increase of computer per household, increase

of Internet users in the country, as well as data on the increasing use of information and communications resources in enterprises. Further development of this activity through the appearance of an increasing number of electronic stores, as well as strategies of access of Serbian enterprises on the global market of electronic commerce stimulate tracking the global trends, enabling new payment systems via the Internet, passing new legal provisions and amending the current laws. In the future, the Republic of Serbia should decide to electronic commerce, as the major developmental opportunity for trade enterprises on the global electronic market.

The current legal provisions in our country represent only a partial solution of current problems. Experiences of market developed countries point to the fact that information technology development applied in commerce via the Internet must be followed by new regulations, as well as continual changes and amendments of existing legal provisions.

A Study of Chinese Governments Informatization

Li Zhang[1] – Björn Johansson[2]

[1]*School of Economics and Management, Beijing Jiaotong University, Beijing, China; lzhang@bjtu.edu.cn*
[2]*Centre of Applied ICT, Copenhagen Business School, Denmark [2]Department of Informatics, Lund University, Sweden, bj.caict@cbs.dk*

Government informatization has gained intense attention in China. After years of development, there have been some achievements, but at the same time, there are still many problems. With a comprehensive analysis on the background of government informatization in China, we expound on the trend of e-government in China, and predict that the trend for government informatization will continue to develop and propose that e-government will be the future direction for government informatization.

As far as modern governing is concerned, the most important effect of informatization is to break up the traditional physical division of administration by applying information communication technology (ICT), to integrate the process of administration, and to perform the function of the government based on electronic government – in short e-government. The core value of e-government lies in the great transparency and simplicity of connection that promote efficiency of administration and social democratization through the process of interactive communication between the government and the general public, and real-time publication of information. Thus, a comprehensive development of administration will be pushed forward. In the paper we adopt Rogers (2000) definition of informatization which means that we define it as: informatization is the process through which new communication technologies are used as a means for furthering development as a nation becomes more and more an information society. E-government can then be said have a close connection to informatization and we define e-government as referring to the use of ICT to provide and improve government services, transactions and interactions with citizens, businesses, and other parts in the government context.

Within the context of rapid development of both economic and information globalization, the development of government informatization has become one of the major factors that influence a country or a region in the global competition. The reason behind this is that a government is, on the one hand, the largest information possessor; and on the other hand, the largest information user. It can be stated that governments, as the "central node" for the organization of a country and the flow of information, constitutes an important aspect of informatization and therefore act as a leading factor boosting informatization. In an information society, information has become the most vital strategic resource. Meanwhile, the increasingly evolving ICT has been widely applied in management of governments. Consequently, information and networking will function as the central neurological system for any government in the future. Correspondingly, the running of a

government equates with the processing of information. Therefore, the development of government informatization shall be regarded as a transformation of the original government in terms of how they deal with information management in the future

Keywords: Government informatization, electronic government, integrated information systems

Theory and Applicant of On-line Rental of EIS for SMEs in China Based on Minimum Social Cost

Hongli Wang

School of Economic and Management, Zhongyuan University of technology,China graduated852@163.com

This paper argues the theory and applicant of online rental of Enterprise Information System for medium-small enterprises in China based on minimum social cost. The mechanism, measure and advice of rental of EIS on medium-small enterprise in China is given. This will provide the direction for the Chinese medium-small enterprise, government, technology provider to implement the online rental.Firstly the reformation and impaction of online rental of EIS on medium-small enterprise in China is analyzed. Online rental of EIS on medium-small enterprise will decrease tremendously the cost of construction of enterprise information system without the decreasing of function. This will decrease the total cost of every role including provider of services, the receiver of service, the erector of mechanism, the technology developer etc.The cost differential analysis between rental and un-rental of enterprise information system is given for medium-small enterprise in China; the cost is calculated to express the merit of online rental. Then the obstruction and cause of embarrassment of online rental of EIS in China is analyzed by investigating questionnaire.

The factors of data security, management and technology are described respectively. Data security is the most important factor which the enterprise considers impacting on the online rental. Then the mechanism of rental of EIS on medium-small enterprise in China is designed in order to give the excellent mechanism to promote the online rental of EIS on medium-small enterprise in China. These mechanisms include law, system, technology and data safety. For example the open-source technology can be used to decrease the social cost to execute the online rental. Lastly the application case of online rental ERP in Enxin technology corporation in Beijing is given to analysis the merits and shortcoming. The advice and promotions of rental of EIS on medium-small enterprise in China is given in order to give the excellent mechanism to promote the online rental of EIS on medium-small enterprise in China.

The online rental of Enterprise Information System for medium-small enterprise is that the applicant ways of enterprise information system is adopt by the online rental of information system by web. And the enterprise using online rental needn't to purchase hardware and software which count for thousands upon thousands capital by itself. The enterprise may make few fun to use information system with the power function. The online rental of Enterprise Information System for medium-small enterprise includes several roles, for example, provider of services, the receiver of service, the erector of mechanism, the technology developer etc. But the applicant of online rental of Enterprise Information System for medium-small enterprise in China is very few.

The small and medium scaled business enterprise of China is already more than 10,000,000, have all of the business enterprises to register 99% of total amount, industrial total production value and revenue from tax have 60% and 40% of whole country respectively and provide about 75% town employment opportunities. This market is always the market that the lord of software manufacturer of China ERP offends for long time. ERP of China manufacturer has been occupying a predominant position in this aspect. But along with the going deep into of foreign software manufacturer of ERP, this part of markets has already got into the visual

field of foreign ERP. The trusteeship type that faces to SMEs along with SAP ERP the product A1 releasing is close to day by day.

Many people starts realizing, the new business model of Internet technique and on-line leasing for business enterprise management software market of impact, finally start going deep into to arrive most ERP of the core system and the biggest management software company in world body up. But local ERP in China the manufacturer nimble reaction toward this new technique and the business current again make us marvel for it: Today that hasn't stopped in the issue concerning finance a software still ERP, the management software of China the manufacturers still calmly kept up with market and technique change of ex- follow footstep. In the domestic, with JinDie, Yongyou, gold abacus and soon reach etc. for manufacturer of the representative's ERP all neither the exception ground took aim at vision ERP of high level market, they all want to pass to be own of diligent formation they special feature, start to support the back of race. But the market isn't accredit because you are a race industry: Compared with the ERP tycoon of abroad, the oneself contains of the management thought of short of and big parts of finances arising from a half way to turn a line to do ERP have been industry insider to generally accepted denounce, and the real strengths, such as funds and technique...etc. the oneself of foreign tycoon is extremely also the margin that enlarged this aspect. They are all deliberating a problem: How can the software of China do just can get into a high level market? Exactly where is the ERP software exit of China? Exactly should adopt what way to then can break the restriction of rounding the city? How much cost differential analysis between rental and un-rental of enterprise information system is given for medium-small enterprise in China? How much cost of construction of enterprise information system is huge for medium-small enterprise in China? How much cost rental and un-rental of enterprise information system in China? What is the obstruction and cause of embarrassment of online rental of EIS in China? The factors of data security, management and technology are described respectively? Data security is the most important factor which the enterprise considers impacting on the online rental?

Keywords: on-line rental, enterprise information system, small and medium enterprises, SME

Information Security Governance of EIS: A United States Perspective

Benjamin KS Khoo

New York Institute of Technology, New York, USA; eMail: kkhoo@nyit.edu

The technological explosion of the Internet in the late 1980s and early 1990s has resulted in a paradigm shift that has affected all aspects of our lives; an emerging trend is a movement toward network centric computing. Enterprises are now operating in the network economy. The network economy is dependent on the information infrastructure. Each day millions of dollars of business transactions and many communication channels are conducted through the information infrastructure via the Internet. Since the 9/11 attack on the twin towers of the World Trade Center in New York, USA, there have been a tremendous amount of effort spent on improving and strengthening the infrastructure of the USA. Organizations of all types (business, academia, government, etc.) are facing risks resulting from their ever-increasing reliance on the information infrastructure. Businesses, government, and non-profit institutions have been found wanting in information security.

As a consequence of this, the USA government implemented a number of National Security Presidential Directives (NSPD) and legislations to secure cyberspace. Information security can be perceived as securing the confidentiality, integrity and availability of information assets in three dimensions – the technical (hardware and software), physical (media, building, equipment, etc) and managerial (policies, procedures, etc) aspects of the asset. The high risks in cyberspace needs to be mitigated and managed. Information Security Governance (ISG) is a pro-active way of mitigating these risks. This paper will examine the issue of Information Security Governance of an enterprise information system at various levels of management, its alignment to the business goals and its relationship to the legislations. It will discuss the ISG processes, the

various metrics that measure the efficiency of the processes and finally, how they can be framed to meet legislations, to show due diligence and continuous process monitoring.

The technological explosion of the Internet in the late 1980s and early 1990s has resulted in a paradigm shift that has affected all aspects of our lives; an emerging trend is a movement toward network centric computing. The term Enterprise Information Systems (EIS) is used to refer to the enterprise-wide computer-based systems that gather and store data, process information and generate reports for management. EIS are now operating in the network economy with expansion to the external stakeholders. The network economy is dependent on the information infrastructure. Each day millions of dollars of business transactions and many communication channels flow through the information infrastructure via the Internet. Organizations of all types (business, academia, government, etc.) are facing risks resulting from their ever-increasing reliance on the information infrastructure. Businesses, government, and non-profit institutions have been found wanting in information security.

The high risks in cyberspace needs to be mitigated and managed. Because of this, the USA government implemented a number of National Security Presidential Directives (NSPD) and legislations to secure cyberspace. Information Security Governance (ISG) is a pro-active way of mitigating these risks. This paper will examine the issue of Information Security Governance of an enterprise information system at various levels of management and its relationship to the legislations. It will discuss the ISG framework, its implementation and finally, how they can be framed to meet legislations to show due diligence and continuous process monitoring.

Keywords: Information Security, Governance, Enterprise Information Systems

SESSION 9
STRATEGY AND SERVICES

Session Chair: Petr Douček

Human Resources in ICT – The Czech Republic Analysis

Petr Douček – Ota Novotny[2]

[1,2]Faculty of Informatics and Statistics, University of Economics, Prague, Czech Republic
eMails: [1]doucek@vse.cz [2]novotnyo@vse.cz

This contribution deals with real results of survey realized during years 2006 - 2007 in the Czech Republic by Faculty of Informatics and Statistics of the University of Economics, Prague and it offers short overview of Czech perspectives in requirements on ICT experts and of ICT formal tertiary education system and its results in ICT experts education for Czech local labour market.

Massive investments into Information Systems/Information and Communications Technologies (IS/ICT) in last twenty years started economic growth. But not all of them were successful – for example the dot com boom in 90s and its intensive reduction on begin of the 21 century. There are different opinions in the world literature, how IS/ICT influence nominates real economic growth and how to measure their contributions to it. IS/ICT of specific properties are very similar to utilities. But the most important and crucial factor of IS/ICT improvement is human resources actually available and applicable on the market. How does look the labour market with ICT experts in the Czech Republic was the topics of our survey. It was supported by the Czech Science Foundation GACR - research project 402/09/0385 - Human Capital in IS/ICT Operations and Development: Competitiveness of Czech Tertiary Education Graduates.

The aim of this survey was to motivate universities and to formulate recommendations for further development of the Czech tertiary education in the area of ICT. Requirements for skills and knowledge of ICT graduates are permanently changing. Building up and to passing the accreditation process of a new study program takes in minimum one year, of course, only under conditions that the school or university has enough experts in required areas (Guarantors of courses).

As a reaction to the low flexibility of the Czech Republic formal education system in the area ICT skills and also to the potential threat from non-ICT university study programs, the Faculty of Informatics and Statistics decided to initiate a research project in order to map:

– ICT education offered in the Czech Republic.
– Demand for ICT skills in the Czech Republic.

The aim of this project was to motivate universities and to formulate recommendations for further development of the Czech university education to top management of universities in the area of ICT. The main goal of the project was to identify at all d the actual number of new students in the first year. The second goal was to perform a survey of the ICT graduates skill requirements in the Czech market. This survey started in September 2006 and in April 2007 we have got the first preliminary results, final results were published in 2008 for the first time. Part of this project was devoted to the analysis of current IT workforce age and skill structure.

Keywords: ICT Education, ICT Curricula, Roles in ICT, Knowledge profiles

Information Technology Strategic Planning with Emphasis on Knowledge

Paulo Henrique de Souza Bermejo[1]–Adriano Olímpio Tonelli[2]–André Luiz Zambalde[3]–José Leomar Todesco[4]

[1,2,3]*Universidade Federal de Lavras* [4]*Universidade Federal de Santa Catarina, Brazil;* [1]*bermejo@ufla.br*
[2]*adrianotonelli@gmail.com* [3]*zamba@ufla.br* [4]*tite@egc.ufsc.br*

This study presents a specific method for ITSP with emphasis on knowledge. Qualitative, applied research was carried out, with an exploratory, descriptive approach and a multiple case study. The resulting method contemplates specific practices in the area of knowledge management (KM), applied to ITSP activities by identifying knowledge sub-processes in the stakeholders´ relationship with the conversion modes (socialization, exteriorization, combination and internalization), types of knowledge involved in IT strategic planning and tools and technologies. The proposal makes possible a better use of organizational knowledge in ITSP and a greater participation of the collaborators in the organizations, contributing directly to the efficacy and effectiveness of the results of information technology strategic planning.

Information Technology strategic planning (ITSP) has been identified as essential for the integration and alignment of information technology (IT) to the business of the organization. Additionally, the incessant search for competitive advantage has triggered the need in many organizations to exploit their main intangible asset - knowledge. The emphasis on the relationship between these two perspectives has not been considered by many studies involving ITSP that may spoil the results and hinder the planning operation. This study presents a specific knowledge–based method for ITSP. Quantitative, applied research was carried out, with an exploratory, descriptive approach and a multiple case study. Finally, a method was obtained specific for knowledge-based ITSP that was tested in eleven different sized organizations in various sectors of the economy. The resulting method contemplates specific practices in the area of knowledge management, applied to ITSP activities by identifying knowledge sub-processes in the stakeholders´ relationship with the conversion modes (socialization, exteriorization, combination and internalization), types of knowledge involved in IT strategic planning and tools and technologies. The proposal makes possible a better use of organizational knowledge in ITSP and a greater participation of the collaborators in the organizations, contributing directly to the efficacy and effectiveness of the results of information technology strategic planning.

The importance of IT strategic planning (ITSP) has been highlighted by many studies, such as those by Lederer and Sarmela; Segars and Grover (1998), Min, Suh and Kim (1999) Lutchen (2004), Mingail (2006), that also refer to specific methods to conduct planning. ITSP is identified as essential in the integration and alignment of IT to the organization and the company, in order to raise competitive advantages, to concentrate efforts, to give direction, constant purpose and flexibility, as a continuous force of the company to improve its strategic position. However, the efficiency of information technology strategic planning is still among the main issues that challenge organization executives. IT has historically made poor total or partial strategic plans, related to the business objectives and strategies and with the general context of the organization. Furthermore, the incessant search for strategic positioning has led many organizations to exploit their main intangible asset- knowledge. This can be seen as an information set retained in the mind of the human being, related to facts, procedures, concepts, ideas, observations and judgments. It is an essential asset for obtaining competitive advantage. Our study presents the proposal and application of a novel method for ITSP considering a better use of organizational knowledge and greater collaborator participation that contribute directly to the efficacy and effectiveness of the results.

Keywords: Information Technology Strategic Planning, Information Systems Planning, Knowledge Management, Information Technology Strategic Management

Agent-Supported Service Management and Monitoring for Flexible Inter-Enterprise Cooperation

András Micsik[1] – Paul Karaenke[2]

[1]MTA SZTAKI, Hungary, micsik@sztaki.hu [2]University of Hohenheim, Information Systems 2, Germany, karaenke@uni-hohenheim.de

The main objective of the service-oriented architecture (SOA) paradigm is to facilitate technical interoperability over organizational boundaries, representing real-world business relationships on the technical information system level. The challenge is to provide means for cross-organizational cooperation in heterogeneous distributed environments on the technical access level as well as integration and interoperability with existing service-oriented systems.

SOA is the currently preferred paradigm for the delivery of services in open, dynamic, uncertain environments without centralized control. Typical SOA solutions provide remote and secure access to services offered by an enterprise, but still the usability of such SOA environment requires more, for example:

– Monitoring of service usage,
– Intelligent management of services,
– Cooperation in service provision.

Monitoring services provides the basic information about service availability and alerts in case of service failures. Beyond that, monitoring can provide valuable data for the scheduling and performance planning of services. While simple services may be available in abundance, services in supply chains or high-performance computing may be limited or may require several resources. In such cases the monitored performance can be used for management of service provisioning.

Management of services may also reach further then stopping and starting services. Each service request implies a certain amount of required resources for its completion. The assignment of resources to service requests is an activity which is orthogonal to the service execution. For simple services, the resource requirements may be static and known a priori. In more complex scenarios, resource requirements may be dependent of the concrete input to the service request and may vary over the service's runtime. Then, monitoring of the resource utilization is required to anticipate the actual short-term resource requirements for the completion of all service requests. If the anticipated resource requirements exceed the service provider's own available resources, it might be preferable to cooperate with other service providers to be able to answer all service requests in time.

There are two typical types of cooperation in service provision, when different service providers are working together for the provision of a service. The first type of cooperation is resource sharing or outsourcing as outlined above, where different service providers have to agree on the conditions of consuming other's resources for service provision. The second type of cooperation is service composition, where the required functionality is achieved by several services acting together. Both types of cooperation require a coordination of the activities of the involved parties.

In the paper we present a generic framework which is able to provide the above listed additional benefits for service-oriented architectures using multi-agent technology. In addition, we utilize formal semantics to tackle inter-organizational terminological heterogeneity. The framework combines several techniques and paradigms to achieve such an integrated functionality. The head body paradigm is used as the leading metaphor for the architecture: it implies a conceptual separation of a software agent into two parts – head and body. The agent's head is used for interactions with other agents being member of the agent society. This includes reasoning about interactions such as participating in cooperative processes for problem solving. The body is encapsulating any other (domain) functionality of an agent. The head body paradigm is used as

follows: WS resources that are represented by agents are part of the body. The agent's core capabilities are implemented in the head; i.e., interactions and especially coordination with other agents in the agent society. On the other hand, the agent body has a set of web service operations as effectors, which are able to control some services providing core business.

Typical WS-to-WS communication is extended towards agent-to-WS, WS-to-agent and SOAP-based agent-to-agent communication. These mechanisms enable agents to poll and manage web services, enable web services to inform and notify agents, and the last one enables agents to communicate securely across organizational domains.

The agent has full control over the WS and communicates with it via the mentioned agent-to-WS and WS-to-agent mechanisms. A web service which is represented by an agent can transparently be invoked by other web services, respectively clients. The agent can evaluate the invocation requests and can reason if an invocation of the encapsulated WS is in accordance to its own goals. If the invocation request is opposed to the goals, the agent can intercept the invocation and the encapsulated WS is not invoked. In addition, the agent is able to gather monitoring information regarding service execution.

As a result of the previous enabling technologies, utilization of multi-agent coordination mechanisms becomes applicable in SOA settings and existing environments. Certain agents of the environment (as heads) are able to use negotiation techniques to agree on service provisioning or on resource consumption. As an example, a use case of airport ground handling is described, where agents represent coordinators, service providers and resources, and reverse combinatorial multi-attribute auctions are used to find the most appropriate service to be used for a ground handling task.

Keywords: multiagent systems, service-oriented architecture, cooperation, monitoring

Strategy Focused Information System Design and Analysis: a Case Study for Bueno Netto Construction Company

Hernani Arruda Monteiro da Silva[1] – Vagner Cavenaghi[2] – João Antônio Mattei[3] – Andrea Joana Barbarelli[4] – Mauricio Teixeira Leão[5] – Reinaldo Ferreira Sima[6] – Arnaldo Ferreira Sima[7]

[1,2]*SIMA Consulting, Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP), Brazil,* [3]*Bueno Nettó, Brazil; eMails:* [4, 5, 6, 7]*SIMA Consulting, Brazil*
eMails: [1]*hernani.arruda@sima.com.br* [2]*vagnerc@feb.unesp.br,* [3]*mattei@buenonetto.com.br,* [4]*andrea@sima.com.br,* [5]*mauricio.leao@sima.com.br,* [6]*reinaldo@sima.com.br* [7]*arnaldo@sima.com.br*

Today's globalization and the severe competition amongst organizations have led them to the search for solid competitive advantages, a major concern for high executives, managers, and strategic decision makers of companies. Good business strategy formulation is not enough for the business success if the strategies are not fully operational and efficient. Time of implementation and the way these strategies are put into action could do great difference as the biggest problems faced by organizations are not related to good strategies formulation, but to poor implementation of such strategies.

In such context, the role of Information Technologies is fundamental, as they participate directly in all steps of the business cycle, from business vision and mission and strategy formulation to operational control. In all of the stages, the correct use of the available Information Technology may be converted in competitive advantages, while its sub-utilization may reflect in threats or disadvantages for the business. Therefore, these technologies may be related to threats or opportunities, depending on the approach and on the way the subject is taken. However, the choice of suppliers and business partners for organization transformation processes and for implementation of strategic management architectures and of information technology have

become more and more complex tasks, mainly because of the growing number of solution offers and because of the similarities of these solutions.

Over the past years, a profound change in the way of looking at IT on organizations has occurred. Due to the dynamic and competitive corporate environment, enterprises have identified the strategic management of information as a potential for competitive advantage, since the availability of an efficient information system allows for a greater agility and security for decision making process. Suppliers of conceptual and technologic solutions, aimed for business management, seek for evolving their offers as market demands and, in some cases, they promote the self-identification of needs by the company, coming to sight specific new demands for the offered solutions. On the other hand, the number of suppliers for these solutions (products and services) has grown over the years, making the process of partners and suppliers search a more complex activity. Moreover, all of this happens in an environment where the project success, the strategic implementation or even the survival of the organizations depend, fundamentally, on the correct choice of partners and suppliers.

International surveys by Gartner Group (2003) show that at least 50% of these types of projects do not present the results expected by organizations. In Brazil, this claim is not so different, as showed on surveys that confirm these conclusions and, moreover, identify the chosen partners and their qualifications as directly responsible for final result of implementation of strategies bound to information technology. The main conclusion of SIMA's survey is that there are strong relationships amongst the results reached by organizations, the strategies formulated and the type of partners that were chosen. Having these surveys as basis, Information Technology Strategic Management (GETI) methodology was structured, and it was adopted in many consulting projects, which results brought forth the importance of adopting control mechanisms that guarantee the management of all project steps.

GETI methodology for implementation of IT Strategic Management, proposed by Arnaldo F. Sima in the 1990s, aims to develop an informational and processes architecture aligned to the organizational strategy.

The purpose of this paper is to present an application of SIMA's methodology for information technology strategic management (GETI) in a construction organization. The methodology GETI was applied to develop information system architecture capable of supporting the operational Bueno Netto company processes, in Brazil, as well as to promote the optimization of its organizational processes and enhance its competitiveness advantage. This paper is divided in six sections: The first one introduces the context of the work and its problematic. The second one seeks for the brief understanding of the evolution of Information Technology market and the solution impacts on organizational management. The third section brings forth the importance of having an IT management aligned with the business global strategy. The Strategic Management of IT (GETI) is presented on the fourth section, and describes a methodology to implement a strategic focused I.T. structure. The fifth section introduces the Bueno Netto case study, that was carried out in six stages of the GETI methodology: Strategic and Operational Mapping; Opportunities Analysis; Conceptual Model Design; Solution and Provider Search, Evaluation and Selection; Project Implementation and Go Live Support; and Application Management and Support, describing the steps of how they were conducted in details. The last section shows the findings, results, and practical implications of using this methodology to support decision making and the importance of the consistent managerial information for business improvement.

Keywords: strategy, information technology, process engineering, Enterprise Resource Planning

SESSION 10 – OGIK TRACK

Presentations and Papers in Hungarian

SECURITY ISSUES OF ERP SYSTEMS
AZ INFORMATIKA BIZTONSÁGI KÉRDÉSEI

Session Chair/Szekcióelnök: János Kovács

Kritikus kérdések és problémakörök az e-business témakörében

Nemeslaki András

*vezető, egyetemi docens; Budapesti Corvinus Egyetem, Kutatóközpont, Hungary;
eMail: andras.nemeslaki@uni-corvinus.hu*

A Budapesti Corvinus Egyetem gazdaságinformatika szakán négy éven át oktattunk az idén kifutó osztatlan képzés E-business szakirányán hallgatókat. Az 5 éves képzés megszűnésével egyrészt lezárul egy képzési korszak, ugyanakkor a bologna-rendszerben elkezdődött egy újabb rendszer a gazdaságinformatikai képzés e-business területén is. Ilyenkor célszerű áttekinteni a szakterület helyzetét, eredményeit illetve az új feladatokat kutatási illetve oktatási irányokat felvázolni.

A gazdaságinformatika szak indulása óta rengeteget fejlődött a hazai internetes infrastruktúra, számos üzleti modell jelent meg a weben, és a fogyasztók is egyre bátrabban vásárolnak, kommunikálnak, „közösségszerveznek" a neten. Számos olyan iparágunk van, amelynek működése nem képzelhető el a internetes csatornák nélkül: pár éve adót vallunk be, egyetemi felvételit végzünk, utazást szervezünk, bankolunk és repülőjegyet veszünk on-line. Az Y és Milleneum generációknak ezen túl a web nemcsak egy médium a sok közül, hanem ez a leglényegesebb számukra; ami itt nem elérhető, az szinte nem is létezik. A bloggolás, chattelés, és az állásinterjúk előtti iwiw látogatás abszolút mindennapos tevékenység. Számos új dolog is felbukkan látókörünkben, az E-business Kutatóközpontban (EBK) 100 feletti a különböző szinvonalú TDK és szakdolgozatok száma többek között a masszív többszereplős szerep játékokról (MMORPG), a dinamikusan növekvő video és konzoljáték iparról, az újszerű on-line reklámozási és marketing technikákról, az on-line szerencsejátékokról és fogadásokról és a jövő intelligens technikáiról. Mindezek alapján úgy látjuk továbbra is komoly jelentősége van az „e-business nézőpontnak" a gazdaságinformatikában.

Cikkünkben először ismertetjük nézőpontunkat, kutatási és oktatási szemléletünket az e-business-szel kapcsolatban. Megmutatjuk azokat a nemzetközi irányokat, amelyekhez ennek kialakításakor illeszkedni igyekeztünk. Ezeket alátámasztjuk hallgatóink és végzettjeink visszacsatolásával, vállalati kutatásaink konklúzióival illetve dolgozó kollégáink tanácsadói tapasztalatival. Számba vesszük feldolgozott témaköreinket, és ez alapján javaslatokat teszünk további vizsgálatok irányába, azok bevonására az oktatásba, azaz e-business területen működők figyelmét ráirányítjuk a véleményünk szerint jelentős problémakörökre.

Kulcsszavak: e-business, elektronikus kereskedelem, üzleti modellek, Web 2.0, E-business Kutatóközpont

Az elektronikus kereskedelmi rendszer biztonsága

Élthes Zoltán[1] – Anna Medve[2] – Klára Kövesi[3]

[1]"Babeş-Bolyai" University, Faculty of Economics Sciences, Romania; eltheszoltan@yahoo.com   [2]University of Pannonia, Hungary; medve.anna@almos.uni-pannon.hu   [3]University of Bretagne Occidental, IAE Business Administration, France; klara.kovesi@univ-brest.fr

A konferencia-előadás és cikk olyan fogalomkörök elméletét és koncepcióját mutatja be, mint az elektronikus aláírás, biztonságos kommunikáció, titkosítási algoritmusok. Biztonságos kommunikációs csatornák létezése elengedhetetlen feltételévé vált az Internet gyors fejlődésének. Ebből az okból, úgy az elektronikus aláírások, mint a digitális pecsét fontos eszközökké váltak azon alkalmazások részére, melyek biztonságot igényelnek. Ezek a technikák alkalmazása csak olyan törvényes keretek között valósítható meg, amely ekvivalenciát biztosit a kézírásos aláírás és az új digitális módszerek között. A cikk egy elemzést végez az elektronikus kereskedelem biztonságával kapcsolatban, illetve a meglevő törvénykezés javítására tesz javaslatot a technológiákkal szemléltetve a folyamatokat. A téma egy természetes folytatása a szerzők előző munkájának.

Úgy gondoljuk, hogy hozzájárul az elektronikus business témakörben létrejövő kutatási csoport tevékenységének megszilárdításához, a Kolozsvári Babeş-Bolyai Tudományegyetem, a Veszprémi Pannon Egyetem valamint a Brest-i Bretagne Ouest Egyetem között.

This paper presents concepts and theories about electronic signature, secure communications, encrypting algorithms. The existence of secure communication channels in the daily use of the World Wide Web has proven to be very important. Therefore, electronic signatures and digital time-stamps have become of critical importance for any application concerned with security. The use of these techniques requires a legal framework, which is essential to securing the equivalence between classic signatures on paper and the new electronic methods. This article presents an analysis of the problems related to secure electronic commerce, and also discusses possibilities of making improvements to the existing laws. The proposed theme is a natural continuation of the authors' previous works. This is will consolidate a research nucleus in electronic businesses between Babeş-Bolyai University of Cluj-Napoca and Pannon University of Veszprém and University Bretagne Occidental IAE Business Administration of Brest.

Keywords: electronic signatures, digital time-stamps, encrypt procedures, e-commerce, security, PKI

e-szolgáltatások és ERP-rendszerek integrált módú információbiztonsága

Anna Medve[1] – Tibor Nagy[2] – Szabolcs Balogh[3] – György Orbán[4] – Peti Kocsi[5] – Klára Kövesi[6]

[1,2,3,4,5]University of Pannonia, Hungary; [1]medve.anna@almos.uni-pannon.hu [6]University of Bretagne Occidental – IAE Business Administration, France; klara.kovesi@univ-brest.fr

Napjainkban, az üzleti folyamatokban az információ biztonsága egyre nagyobb kockázati tényezővé válik. A minőségbiztosítás és az informatikai biztonság kialakításának folyamatai a szoftverfolyamattal rokon tevékenységeket tartalmaznak, a szoftverfolyamat eszközeivel a biztonsági célok és eljárások modellezhetők az üzleti stratégiatervezés számára. Az így nyert szabványkövető modellek konkrét üzleti stratégiák mentén újrafelhasználhatóak a gyors változáskövetést támogatva. A téma egy természetes folytatása a szerzők előző munkájának. Úgy gondoljuk, hogy hozzájárul a folyamatok menedzselésére elektronikus üzleti technológiák témakörben létrejövő kutatási csoport tevékenységének megszilárdításához, a veszprémi Pannon Egyetem valamint a breszt-i Bretagne Ouest Egyetem között.

This paper presents e-servece information security integration within business strategies using security standards and srandardised tools. The framework for user requirements engineering have the abilities for involving business decisions makers to using it and making the simulations and negotiations themselves. We are integrating in the framework generic models on relations between recommendations of information security standard. The models and technics are useful to reuse it and support by the the rapid change management. The proposed theme is will consolidate a research nucleus in information systems management fields for electronic businesses between Pannon University of Veszprém and University of Bretagne Occidental – IAE Business Administration of Brest.

Keywords: e-szolgáltatás, e-commerce, információbiztonság, information security, ISO/IEC 27001, URN, UCM, GRL, ügyfélhűség, CRM

Információbiztonság mint a modern társadalom kihívása

Spilák Viktor[1] – Kosztyán Zsolt Tibor[2]

[1]KÜRT Zrt, Hungary; spilakviktor@gmail.com [2]Pannon Egyetem,Szervezési és Vezetési Tanszék, Hungary; kzst@gtk.uni-pannon.hu

Napjainkban a biztonsággal kapcsolatos vélekedés alapjában megváltozott. Ma már természetes, hogy a legkülönbözőbb élethelyzetekben merül fel a biztonság és a kockázatarányos védelem kérdése. Nem a biztonsági eszközök száma és a rájuk költött összegek a meghatározóak, hanem az eszközök által szavatolt biztonság. Feladatunkat képezte, hogy a piaci felméréseink eredményeit elemezve üzleti oldalról is alátámasszuk az Integrált Biztonsági Rendszer koncepcióját, meghatározzunk egy teljes körű biztonsági megoldások nyújtására alkalmas integrált biztonsági rendszerrel szemben támasztott legfontosabb üzleti/felhasználói elvárásokat és az ehhez kapcsolódó funkcionális specifikációt.

Munkánkban felvázoljuk a magyarországi szervezetek biztonságról alkotott képét, biztonságtudatosságát. Meghatározzuk a biztonsági hiányosságaikat, és ezekre az egyes iparágak sajátosságait figyelembe véve dolgozunk ki ajánlásokat. Különös hangsúlyt fektetünk a költségtényezők elemzésével az általunk javasolt megoldások iparág specifikus alkalmazhatóságára. Az ajánlásokat négy iparág szemszögéből vizsgáljuk, melynek eredményeként az egyes problémákra nyújtott iparági specifikus válaszokat egy mátrixba összesítjük, és megvalósításuk szükségességét prioritásértékkel látjuk el.

Kulcsszavak: információbiztonság, szervezeti biztonság, integrált biztonság, iparági ajánlás

A mérési bizonytalanság figyelembe vétele gyártásirányító rendszereknél

Hegedűs Csaba

Pannon Egyetem, Szervezési és Vezetési Tanszék, Hungary; hegeduscs@gtk.uni-pannon.hu

A gyártási folyamatok megfelelőségének értékelését és a mérőműszerek kalibrálását egyaránt támogathatják szoftverek, de nem áll rendelkezésre olyan alkalmazás, ami a mérési bizonytalanság ismeretében optimalizálná a megfelelőségi döntéseket. Tanulmányomban bemutatom, hogy mindendarabos vizsgálatnál elegendő a mérési bizonytalanság eloszlásának és az egyes döntési kimenetelek költség- és bevételszerkezetének ismerete, hogy maximalizáljuk a profitot. Az analitikus számítások és szimulációk eredményeként kapott összefüggés beépíthető a termelésirányító rendszerekbe és az elfogadás vagy visszautasítás mellett további cselekvési alternatívákat definiálhatunk. Megadhatjuk, hogy mely határokon kívül kell újramérni, újból megmunkálni a terméket. Összességében tehát egy olyan döntéstámogató vagy szakértői rendszer alakítható ki, amellyel maximalizálható a döntések várható profitja. A termelésirányításhoz, a megfelelőség-szabályozáshoz használt alkalmazások lehetnek az integrált információs rendszer részei vagy különálló speciálisan a vevő igényeihez vagy az előállítás, megfelelőség ellenőrzés műszereihez igazított szoftverek. Az ilyen szoftverekben általában külön kezelik a termékek, folyamatok megfelelőségére és vizsgálatokhoz használt mérőműszerek kalibrálására vonatkozó adatokat. Ha van is kapcsolat a mérési bizonytalanság vizsgálata és a megfelelőség értékelése között, az kimerül abban, hogy adott bizonytalansággal rendelkező műszer használható-e a termék adott jellemzőjének vizsgálatához, vagy sem. A megfelelőség ellenőrzéséhez, az adatok értékeléséhez használt statisztikai szoftverek segítenek eldönteni, hogy adott termék továbbengedhető vagy leselejtezendő, de nem kezelik a mérési bizonytalanságot. A kalibráláshoz használt alkalmazások pontos képet adnak a mérőműszer mérési hibájáról, a mérési értékek szóródásának eloszlásáról, de nem tesznek javaslatot arra, hogy adott mérési bizonytalanság esetén hogyan döntsünk. Nincs meg az integráció a megfelelőség kezelése és a mérési bizonytalanság meghatározása között.

Kulcsszavak: mérési bizonytalanság, megfelelőség-értékelés, döntési hiba, optimalizálás

SESSION 11 – OGIK TRACK

Presentations and Papers in Hungarian

ENTERPRISE INFORMATION SYSTEMS SOLUTIONS
ERP-RENDSZER MEGOLDÁSOK

Session Chair/Szekcióelnök: Erzsébet Noszkay

Disztribútorok és ERP rendszerek
összehasonlító elemzését támogató modell

Rózsa Tünde

Debreceni Egyetem, Gazdasági- és Agrárinformatikai Tanszék,Hungary; rozsa@thor.agr.unideb.hu

A világ- és a nemzetgazdaság egyik fontos pillérét alkotják a kis- és középvállalkozások. Jelentős szerepük van a foglalkoztatásban és a technikai innovációban. A tapasztalatok szerint a kis- és középvállalkozások nagy része rendelkezik valamilyen tranzakció kezelő rendszerrel, ha mással nem legalább egy raktárnyilvántartó-, vagy egy számlázó programmal. A pénzügyi és számviteli folyamataik ha nem is helyben, hanem kihelyezett formában, legtöbb esetben egy számítógéppel támogatott rendszer keretein belül kerülnek feldolgozásra. Ezek az alkalmazások, még ha szigetszerűen támogatják is a vállalkozási tevékenységet, nélkülözhetetlenek. Azonban a fejlődés és a kapacitások minél jobb kihasználásának igénye előbb utóbb elvezet az integráció szükségességéhez. A tevékenységek nyomonkövethetősége azonban ritkán indukálja a meglévő rendszerek integrálását, ezért a döntések egy új rendszer bevezetését szorgalmazzák. Egy új rendszer bevezetésénél a nem megfelelő előkészítés vagy a rossz választás miatt, egyes becslések szerint csak minden harmadik ERP rendszer bevezetése jár sikerrel. A siker kulcsát az egyéni üzleti-informatikai modell létrehozásában látják a gyakorlati szakemberek, amely az üzleti elképzelések és az informatikai megoldások teljes összhangját adja. Egy jól kialakított, vállalati stratégián alapuló üzleti modell értékálló, melyre joggal támaszkodhat a vállalkozás.

Tapasztalataink szerint a kis- és középvállalkozások számára nehézséget jelent az ERP kínálat megfelelő szelekciója. Ezen vállalkozások számára a szakmai segítség sok esetben nem megfizethető. Másik nehézsége az ERP kiválasztásnak, hogy a potenciális megoldások azonos szempont szerinti összehasonlítására nem áll rendelkezésre megfelelő döntéstámogató eszköz, viszont léteznek jól alkalmazható módszerek. Ezeket a módszereket kívántuk átalakítani a kis- és középvállalkozások igényei és adottságai szerint. Az általunk kidolgozott, egy többtényezős értékelési eljáráson alapuló modell alkalmas arra, hogy azonos szempontok alapján értékeljen különböző disztribútori ajánlatokat. A modell alapján történő értékelés nem mellőzi teljesen a szubjektív megítélést és bizonyos rendszerismeretet is feltételez, viszont előnye, hogy azonos ismérvek alkalmazásával segíti a kiválasztást.

Kulcsszavak: ERP projekt, összehasonlító elemezés, ERP értékelés

ERP rendszerek a gyakorlatban,
hazai és nemzetközi megvalósítások elemzése

Szabó Gyula

Dennis Gabor Applied University,Hungary; eMail: szabogy@gdf.hu

Magyarországon is, de főként Németországban elmúlt évek informatikai fejlődésére az a jellemző, hogy a vállalkozások egyre nagyobb mértékben az adatfeldolgozó rendszerüket saját erőből való továbbfejlesztés helyett a piacon kapható ERP-rendszerekkel, (programcsomagokkal) modernizálják. Itthon 2008-ban, Németországban 2009-ben végeztünk szakirodalmi elemzést, hat német cégnél helyszíni, szakmai felmérést és beszélgetést, illetve három német egyetemen tanszékvezető professzorokkal véleménycserét folytattunk.

Célunk az volt, hogy választ keressünk a következő kérdésekre:

– Mi kényszeríti a cégeket arra, hogy saját fejlesztés helyett ERP rendszert vegyenek?
– Milyen fázisai vannak az átállásnak, mi a sikeres bevezetés titka?
– Milyen előnyökkel/hátrányokkal jár egy ERP vásárlása, szemben a saját fejlesztéssel?
– Mit célszerű átalakítani, a szervezetet és a folyamatokat az ERP-hez, vagy az ERP-t módosítani a meglévő feldolgozási tevékenységekhez?
– Milyen funkciók kerülnek nemzetközi cégeknél (pl. Shell) az anyavállalathoz és milyen feldolgozó modulok maradnak „ország specifikusan" a adatfeldolgozó rendszer internacionalizálódása esetén?

Hazai felmérésünket tizennyolc, a Gábor Dénes Főiskolán megvédett diplomamunka kiértékelésével kezdtük, melyek közül az ismertebb, nemzetközi hálózattal is rendelkező cégek a következőek voltak: Borstlap b.v, ÉMÁSZ NyRt., IBM Váci gyár, K&H Bank, MNB, MOL, Shell Hungary Kft, URSA Zrt. Jelentős segítséget adtak az MS Navision rendszer terjesztését végző Multisoft Kft szakembereivel folytatott szakmai megbeszélések, melyeken az ERP parametrizálási és adatmigrációs feladatait tekintettük át, a cég több mint száz gyakorlati megvalósításából eredő tapasztalatainak elemzésével. A németországi kutatásokat és gyakorlati felméréseket az Alexander von Humboldt Alapítvány (AvH-Stiftung, Bonn) támogatásával hajtottuk végre a következő egyetemeken, illetve cégeknél:

– Friedrich Alexander Egyetem, Erlangen-Nürnberg, Prof. Dr. Peter Mertens,
– Goethe Egyetem, Frankfurt/M, Prof. Dr. Roland Holten,
– Georg August Egyetem, Göttingen, Prof. Dr. Matthias Schumann,
– ATOS-ORIGIN GmbH, Frankfurt/M,
– Leistritz GmbH, Nürnberg,
– Neckermann Ag, Frankfurt/M,
– Prof Schumann GmbH, Göttingen,
– Stäubli AG, Bayreuth,

A cégeknél folytatott beszélgetések, egy előre elküldött kérdéskatalógus alapján történt, mely a javasolt válaszirányokat is tartalmazta. Az ERP-rendszerek bevezetésével kapcsolatos kérdések:

– Milyen tényezők vezettek oda, hogy saját fejlesztés helyett ERP-re tértek át és milyen előnyökkel számoltak?
– Hogyan történt a rendszer kiválasztása?
– Mennyi ideig tartott az ERP rendszer kiválasztása?
– Milyen projekt előkészítési tevékenységeket terveztek és hogy hajtották végre ezeket?
– Milyen ERP bevezetési fázisok voltak, meddig tartottak?
– Milyen problémák léptek fel az ERP használatba vétele után?
– Milyen problémák léptek fel az ERP rendszer bevezetési folyamata során?
– Ismert-e a bevezetett ERP üzemeltetési költsége, lehet-e ezt csökkenteni?
– Mennyire függ a cég az ERP-szállítótól?
– Megfelel az új rendszer az elvárásoknak?"

Szakirodalmi és gyakorlati tapasztalatainkat a következő fejezetekben összegezzük, melynek során az előzőekben feltett kérdésekre is választ adunk. Célunk az is, hogy egy ERP bevezetésére, annak tervezési és kivitelezési fázisaira egy követhető, „standardizálható" megoldást javasoljunk.

In recent years data processing characterized by the fact that companies, rather than to develop of its previous data-processing systems on its own, merits of the market available to modernize applications. Nowadays enterprise organizations often come up against the problem that they cannot economically satisfy the requirements of quick and punctual information service with the usual tools they use with the given human resources and the conditions. A company's ERP system can implement all the processing of a single information system for us. Such systems usually implement firm-wide or company group wide integration. These systems provide the information necessary for driving the levels of decision making, processing of business

transactions in a wider range. In the presentation we give a survey of eight domestics and four German companies summarized practical experience. We analyze the process of a successful introduction of an ERP System from the decision to the deployment of the system. We give a system application for companies who want to use an new ERP System instead of an old EDP System.

Az adatbányászat alkalmazási lehetőségei az erdészet területén

Pödör Zoltán

Nyugat-Magyarországi Egyetem, Hungary; eMail: podzol@emk.nyme.hu

Tanulmányom célja annak bemutatása, hogy az adatbányászat eszköztára hatékonyan alkalmazható az erdészettel kapcsolatos tudományterületeken is, akár a már létező metódusok kiegészítéseként, illetve új típusú megközelítésként. A hagyományos megközelítésben gyakran jellemző, hogy az adatokat egy már korábban felállított hipotézis igazolására használjuk. Az adatbányászat ezzel szemben inkább azt az irányt képviseli, hogy a rendelkezésre álló adatok vizsgálatával keresünk összefüggéseket.

Az általam vizsgált adatbázis egy 55 éves bükkössel kapcsolatos mérések adatait tartalmazza, 90 attribútummal és nagyságrendileg 110000 rekorddal. A célomnak megfelelően szerettem volna bemutatni, hogy az MSSQL Server 2008 adatbányászati eszköztárnak milyen alkalmazási lehetőségei vannak egy ilyen adathalmazban. Bemutatom a Naive Bayes és döntési fa osztályozási algoritmusok lehetőségeit. Az előbbi segítségével feltérképezhetjük az attribútumaink közötti összefüggéseket, meghatározhatjuk, hogy egy paramétert mely másik paraméterek határoznak meg leginkább, illetve melyek legkevésbé. A döntési fa segítségével arra a kérdésre is választ kaphatunk, hogy a vizsgált attribútum értékeit az input attribútumok hogyan határozzák meg. Mindkét algoritmus alkalmas arra, hogy a jóslandó paraméter értékeit az input paraméterek ismeretében jó valószínűséggel maghatározzuk. Megmutatom a klaszterezés és idő sorok elemzésének lehetőségeit. Ez utóbbi algoritmusnak két fontos alkalmazása is felmerülhet: az input paraméterek alapján előre jósolhatjuk adott paraméterek értékeit, illetve vizsgálhatjuk, hogy bizonyos paraméterek változása esetén a jövőbeni érték hogyan változik.

Kulcsszavak: adatbányászat, klímakutatás, erdészeti adatbázisok, hiányzó adatok pótlása

Webes alkalmazások akadálymentesítése – az e-learning szemszögéből

György Vigh

Magyar Posta Zrt. Informatikai Szolgáltató Központ, Hungary; eMail: vigh.gyoergy@posta.hu

Az internet még alig nagykorú, de fejlődése máris új szakaszba lépett. Előbb csak sokunk számára a hétköznapi élet nélkülözhetetlen eszközévé vált, ma már viszont egyre inkább olyan új társadalom- és közösségformáló erő, amely jó eséllyel legalább annyira megváltoztatja hétköznapjainkat, mint annak idején a kerék vagy az elektromos áram feltalálása. Vajon mindenki részére elérhetők a neten található információk, tananyagok? Mi a helyzet nálunk?

Becslések szerint Magyarországon mintegy 1 millió fogyatékkal élő van, akik közül legkevesebb 300 ezer embertől vonják meg az interneten való akadálymentes böngészés lehetőségét. A fogyatékos személyek jogairól és esélyegyenlőségük biztosításáról szóló 1998. évi XXVI. törvény előírja, hogy részükre biztosítani kell a hozzáférést a közérdekű információkhoz, továbbá azokhoz az információkhoz, amelyek a fogyatékosokat megillető jogokkal, valamint a részükre nyújtott szolgáltatásokkal kapcsolatosak. Ráadásul az Európai Unió egyik direktívája, hogy részükre a közszolgálati honlapok elérését is szükséges biztosítani a részükre. A milliárdnyi honlap közül alig 1/5-e alkalmazkodik a megjelenés elemi, ergonómiai, illetve kódolási

szabályaihoz, s teremt lehetőséget arra, hogy a hátrányos helyzetű felhasználók (például vakok, gyengénlátók, idősek, idegenajkúak, gyengébb paraméterű konfigurációval rendelkezők) is hiánytalanul megtekinthessék a kívánt oldalakat vagy elektronikus tananyagokat.

Az interneten fellelhető problémák a távmunkával foglalkozó portálokat, honlapokat is érintik, illetve előfordulnak az offline módon terjesztett webes alkalmazások – például elektronikus tananyagot tartalmazó CD-k – esetében is. Ezért érzem úgy, hogy az általam feltárt hiányosságokról ezen a konferencián is foglalkozni kell. A témában tartandó előadásom célja az, hogy minél több olyan webes alkalmazás (például távmunkával kapcsolatos portál, honlap vagy bárkinek, akár egy távmunkásnak szánt, az élethosszig tanulás jegyében készített elektronikus tananyag) kerüljön átdolgozásra, illetve szülessen, amely megfelel a különböző szabványoknak, és nem utolsó sorban eleget tesz az akadálymentesítéssel szemben támasztott követelményeknek is.

The Internet has hardly come of age but its development has already entered a new phase. First it simply became an indispensable tool in the ordinary lives of many of us, but today it is more and more a new force forming society and community which has a good chance of changing our day-to-day lives at least as much as the discovery of the wheel or the invention of electric power did. But is information and learning material available on the web accessible for everyone? What's the situation in Hungary? According to estimates there are about 1 million disabled people in Hungary, of whom at least 300,000 people are excluded from the chance of browsing the web without hindrances. The problems that can be found on the Internet likewise affect distance work portals and web sites, and occur on web applications spread offline, for instance with CDs containing electronic educational material. For this reason I believe that the deficiencies I have explained should be dealt with at this conference. The purpose of my speech to be made on this subject is to rework or create as many web applications as possible (for example, distance work portals and web sites or electronic educational material prepared for anyone, even a distance worker, in the spirit of lifelong learning) which conform with the various standards and last but not least meet the requirements for accessibility as well.

Hibrid eljárás a diszkont pénzáramos erőforrás-korlátos projekt ütemezési probléma megoldásához

Láng Blanka

Budapesti Corvinus Egyetem, Hungary; eMail: blanka.lang@uni-corvinus.hu

Előadásomban egy hibrid eljárást mutatok be a diszkont pénzáramos erőforás korlátos projekt ütemezési probléma megoldására. Az ajánlott eljárásban az erőforrás-korlátos projekthez a 'legjobb' ütemezést keresem, ahol a 'legjobb' jelző alatt egy minimális-hosszú erőforrás-korlátos ütemezést értünk, maximális mértékű nettó jelenértékkel. Az optimális ütemezés elméletileg egy MILP programozási feladat megoldását jelenti, amely kisméretű projektekre elfogadható idő alatt megoldható. Az alkalmazott hibrid-eljárás egy konfliktus-javító, harmónia-kereső metaheurisztika és egy lineáris programozáson alapuló lokális keresőalgoritmus kombinációja. A hibrideljárás kihasználja azt a tényt, hogy nemkorlátos nettó jelenérték maximalizálási probléma megoldható polinomiális idő alatt, ha a megelőző-követő relációkat totális unimoduláris formulával írjuk le. A lineáris programozási probléma megoldásához egy korszerű LP-szolvert (líneáris programozási szoftver) alkalmaztunk. Az ajánlott metaheurisztika hatékonyságának és életképességének szemléltetésére számítási eredményeket adunk a jól ismert és népszerű PSPLIB tesztkönyvtár J30 részhalmazán futtatva. Az egzakt megoldás generálásához egy korszerű MILP szoftvert (CPLEX) alkalmaztunk.

SESSION 12
SOCIAL NETWORKING

Session Chair: Miklos Biro

Business Drivers and Challenges of Cloud Computing and Social Networking Application Development

Miklós Biró

Corvinus University of Budapest, Hungary; miklos.biro@informatika.uni-corvinus.hu

This paper addresses those business and academic audiences who are not developers, but who are highly responsive to the new opportunities offered by the rapidly changing software and hardware technology. Following the overview of the business drivers and of the architectural requirements of the subject area, we will actually develop within a few minutes the social software the audience can use during the presentation itself to experience its effect.

In order to highlighting the importance of this topic, here is the sharp opinion of Oracle's chief executive Larry Ellison from The Wall Street Journal Business Technology Blog [09/25/2008]:

> *"The interesting thing about cloud computing is that we've redefined cloud computing to include everything that we already do. I can't think of anything that isn't cloud computing with all of these announcements. The computer industry is the only industry that is more fashion-driven than women's fashion. Maybe I'm an idiot, but I have no idea what anyone is talking about. What is it? It's complete gibberish. It's insane. When is this idiocy going to stop?"*

[http://blogs.wsj.com:80/biztech/2008/09/25/larry-ellisons-brilliant-anti-cloud-computing-rant]

The essence of social software is summarized for example in the analysis of the top 10 strategic technologies for 2009 published by Gartner.

> *"Social software includes a broad range of technologies, such as social networking, social collaboration, social media and social validation. Organizations should consider adding a social dimension to a conventional Web site or application and should adopt a social platform sooner, rather than later, because the greatest risk lies in failure to engage and thereby, being left mute in a dialogue where your voice must be heard."*

[http://www.gartner.com/it/page.jsp?id=777212]

Keywords: cloud computing, web-oriented architecture, social software and networking, coupling, web services, zero code development, software as a service, multitier architecture, message board

CONTENT

The OGIK Track of the CONFENIS Conference (the papers and presentation are in Hungarian):