

Gabor Magyar • Gabor Knapp • Wita Wojtkowski
W. Gregory Wojtkowski • Jože Zupančič
Editors



Advances in Information Systems Development

New Methods and Practice
for the Networked Society



Volume 1

 Springer

Advances in Information Systems Development

**New Methods and Practice
for the Networked Society**

Volume 1

Advances in Information Systems Development

**New Methods and Practice
for the Networked Society**

Volume 1

Edited by

Gabor Magyar and Gabor Knapp

*Budapest University of Technology
Budapest, Hungary*

Wita Wojtkowski and W. Gregory Wojtkowski

*Boise State University
Boise, Idaho USA*

Jože Zupančič

*University of Maribor
Kranj, Slovenia*

 **Springer**

Gabor Magyar
Budapest University of Technology
and Economics
Budapest 1111
Muegyetem rkp. 1-3.
Hungary
magyar@mail.bme.hu

Gabor Knapp
Budapest University of Technology
and Economics
Budapest 1111
Muegyetem rkp. 1-3.
Hungary
knapp@nava.hu

Wita Wojtkowski
Boise State University
1910 University Drive
Boise, Idaho 83725
USA
wwojtkow@boisestate.edu

W. Gregory Wojtkowski
Boise State University
1910 University Drive
Boise, Idaho 83725
USA
gwojtkow@boisestate.edu

Jože Zupančič
University of Maribor
Systems Development Laboratory
SI-6400 Presernova 11
Slovenia
joze.zupancic@fov.uni-mb.si

Proceedings of the 15th International Conference on Information Systems Development—New Methods and Practice for the Networked Society (ISD 2006), held in Budapest, Hungary, August 31–September 2, 2006.

Volume (1): Part 1 of a two-volume set.

ISBN-13 978-0-387-70760-0

e-ISBN-13 978-0-387-70761-7

Library of Congress Control Number: 2007929540

© 2007 Springer Science+Business Media, LLC

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, LLC, 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

Printed on acid-free paper.

9 8 7 6 5 4 3 2 1

springer.com

Preface

This book is the outcome of the Fifteenth International Conference on Information Systems Development, ISD'2006, held in Budapest, Hungary between 31st August – 2nd September 2006. The theme of the 2006 conference was “New Methods and Practice for the Networked Society”.

This theme expresses that we are living in a new era when practically all of our information resources are organized and managed in a networked environment. Information technology has reformed and restructured the workflows of companies and other organizations over the past several decades, and will continue to do so well into the future. This is particularly important now, as we see the emergence of complex networked information systems. “Being digital” by Nicholas Negroponte was the watchword at the dawn of the information society. “Being online” is now at the very heart of our everyday life. New postulates and requirements are stemming from this nature of society of today and tomorrow. The convergence of IT and infocommunication technologies has presented a challenge for the ISD profession in terms of accommodating mobility, interoperability, the “always connected” state of information systems, the evolving distributed nature of information resources and the growing volume and diversity of information. IS development, both as a professional and academic discipline, has responded to this challenge through methodologies, tools and theory development. Progress in ISD comes from research as well as from practice. The aim of the Conference was to provide an international forum for the exchange of ideas and experiences between academia and industry, and to stimulate exploration of new solutions.

The ISD Conference evolved from the first Polish-Scandinavian Seminar on Current Trends in Information Systems Development Methodologies, held in Poland in 1988. It was a great honour and responsibility for us to organize the fifteenth event within this fine series of conferences.

Putting together a book of this magnitude requires the cooperation and assistance of many professionals with much expertise. We would like to express our

gratitude to all the authors and participants for contributing to the conference that we believe to have been successful and memorable. The conference call for papers attracted a great number of very high quality papers. All papers were double-blind refereed by at least two independent reviewers and an Associate Editor. They provided detailed reviews on all papers submitted. We would like to thank the IPC members for their essential work.

Many thanks are due also to the assistance in organization of ISD 2006, especially to the Scientific Association for Infocommunications (HTE) and to the Conference Secretary, Mr. Sándor Szaszko. We are also grateful to the National Office for Research and Technology (NKTH) for the financial support of the Conference.

Gabor Magyar,
Gabor Knapp
Conference co-Chairs,
ISD 2006

International Science Committee

Witold Abramowicz	Economic University	Poland
Gary Allen	University of Huddersfield	UK
Erling S. Andersen	Norwegian School of Management	Norway
Karin Axelsson	Linköping University	Sweden
Juris Borzovs	Riga Technical University	Latvia
Frada Burstein	Monash University	Australia
Rimantas Butleris	Kaunas University of Technology	Lithuania
Albertas Caplinskas	Institute of Mathematics and Informatics	Lithuania
Sven Carlsson	Lund University	Sweden
Dubravka Cecez-Kecmanovic	University of NSW	Australia
Antanas Cenys	Semiconductor Physics Institute	Lithuania
Rodney Clarke	University of Wollongong	Australia
Heitor Augustus Xavier Costa	Universidade Federal de Lavras	Brazil
Darren Dalcher	Middlesex University	UK
Gert-Jan de Verde	University of Nebraska at Omaha	USA
Vitalijus Denisovas	Klaipeda University	Lithuania
Dalé Dzemydiene	Law University	Lithuania
Jorgen Fischer Nilsson	Technical University of Denmark	Denmark
Julie Fisher	Monash University	Australia
Guy Fitzgerald	Brunel University	UK
Marko Forsell	SESCA Technologies Oy	Finland
Odd Fredriksson	Odd Fredriksson	Sweden
Chris Freyberg	Massey University	New Zealand
Edwin Gray	Glasgow Caledonian University	UK
Shirley Gregor	Australian National University	Australia
Janis Grundspenkis	Riga Technical University	Latvia
G. Harindranath	University of London	UK
Igor Hawryszkiewicz	University of Technology Sydney	Australia
Haav Hele-Mai	Institute of Cybernetics at Tallinn Technical University	Estonia
Alfred Helmerich	Research Institute for Applied Technology	Germany

Juhani Iivari	University of Oulu	Finland
Sergey Ivanov	George Washington University	USA
Mirjana Ivanovic	University of Novi Sad	Serbia and Montenegro
Lech J. Janczewski	University of Auckland	New Zealand
Murray Jennex	San Diego State University	USA
Roland Kaschek	Massey University	New Zealand
Marite Kirikova	Riga Technical University	Latvia
Gabor Knapp	Budapest University of Technology and Economics	Hungary
John Krogstie	Norwegian University of Science and Technology	Norway
Marian Kuras	Cracow Academy of Economics	Poland
Rein Kuusik	Tallinn Technical University	Estonia
Sergei Kuznetsov	Institute for System Programming of Academy of Science	Russia
Michael Lang	National University of Ireland	Ireland
Mikael Lind	University of Boras	Sweden
Henry Linger	Monash University	Australia
Bjorn Lundell	University of Skoevde	Sweden
Audrone Lupeikiene	Institute of Mathematic and Informatics	Lithuania
Leszek A. Maciaszek	Macquarie University	Australia
Gabor Magyar	Budapest University of Technology and Economics	Hungary
Majed Al-Mashari	King Saud University	Saudi Arabia
Heinrich C. Mayr	University of Klagenfurt	Austria
Elisabeth Metais	CNAM University	France
Robert Moreton	University of Wolverhampton	UK
Pavol Navrat	Slovak University of Technology	Slovakia
Lina Nemuraite	Kaunas University of Technology	Lithuania
Anders G. Nilsson	Karlstad University	Sweden
Ovidiu Noran	Griffith University	Australia
Jacob Norbjerg	Copenhagen Business School	Denmark
Jari Palomaki	Technical University of Tampere	Finland
Malgorzata Pankowska	University of Economic Katowice	Poland
George A. Papadopoulos	University of Cyprus	Cyprus
Anne Persson	University of Skövde	Sweden
Alain Pirotte	University of Louvain	Belgium
Jaroslav Pokorny	Charles University in Prague	Czech Republic
Stephen Probert	University of London	UK
Boris Rachev	Technical University of Varna	Bulgaria

Karel Richta	Czech Technical University	Czech Republic
Kamel Rouibach	Kuwait University	Kuwait
Timothy K. Shih	Tamkang University	Taiwan
Klaas Sikkell	Universiteit Twente	Netherlands
Guttorm Sindre	Norwegian University of Science and Technology	Norway
William Song	University of Durham	UK
Ioannis Stamelos	Aristotle University	Greece
Larry Stapleton	Waterford Institute of Technology	Ireland
Eberhard Stickel	Bonn University of Applied Sciences	Germany
Uldis Suskovskis	Riga Technical University	Latvia
Istvan Szakadat	Budapest University of Technology and Economics	Hungary
Sandor Szaszko	Budapest University of Technology and Economics	Hungary
Janis Tenteris	Riga Technical University	Latvia
John Traxler	University of Wolverhampton	UK
Jacek Unold	Wroclaw University of Economics	Poland
Olegas Vasilecas	Vilnius Gediminas Technical University	Lithuania
W. Gregory Wojtkowski	Boise State University	USA
Wita Wojtkowski	Boise State University	USA
Carson C. Woo	University of British Columbia	Canada
Stanislaw Wrycza	University of Gdansk	Poland
Ilze Zigurs	University of Nebraska at Omaha	USA
Joze Zupancic	University of Maribor	Slovenia
Jozef Zurada	University of Louisville	USA

Contents

A Revised Perspective on Documentation Practices in the Modern Organisation .. 1 <i>J. Coady, R. Pooley</i>	
Towards a Dialectic Understanding of Enterprise Systems – Vendor Challenges and Contradictory Rhetoric 11 <i>Stig Nordheim</i>	
Understanding Strategic ISD Project in Practice – An ANT Account of Success and Failure 23 <i>Rebecca Abraham, Dubravka Cecez-Kecmanovic, Karlheinz Kautz</i>	
How Can Organizations Achieve Competitive Advantages Using ERP Systems Through Managerial Processes? 37 <i>Carl Erik Moe, Erik Fosser, Ole Henrik Leister, Mike Newman</i>	
Novel Approach to BCG Analysis in the Context of ERP System Implementation 47 <i>Neven Vrček, Željko Dobrović, Dragutin Kermek</i>	
Approach to Enterprise Knowledge Base Development 61 <i>Saulius Gudas, Rasa Brundzaitė</i>	
Co-designing Models for Enterprises and Information Systems – A Case for Language Integration 73 <i>Peter Rittgen</i>	
The Integration of Functional Decomposition with UML Notation in Business Process Modelling 85 <i>Adam Przybyłek</i>	
The Framework for Adaptable Data Analysis System Design 101 <i>Olegas Vasilecas, Aidas Smaizys</i>	
A Comparative Review of Approaches for Database Schema Integration 111 <i>Aiste Aleksandravičienė, Rimantas Butleris</i>	
Strategic Use of Customer Relationship Management (CRM) in Sports: The Rosenberg Case 123 <i>Bjørn Furuholt, Nils Georg Skutle</i>	

Towards Knowledge Management Oriented Information System: Supporting Research Activities at the Technical University	135
<i>Marite Kirikova and Janis Grundspenkis</i>	
An Architecture for Highly Available and Dynamically Upgradeable Web Services	147
<i>Nearchos Paspallis and George A. Papadopoulos</i>	
Distributed Service Development in Personal Area Networks.....	161
<i>Miklós Aurél Rónai, Kristóf Fodor, Gergely Biczók, Zoltán Turányi, and András Valkó</i>	
Using a SOA Paradigm to Integrate with ERP Systems.....	179
<i>António Martins, Pedro Carrilho, Miguel Mira da Silva and Carlos Alves</i>	
SOA-MDK: Towards a Method Development Kit for Service Oriented System Development	191
<i>Balbir S. Barn, Hilary Dexter, Samia Oussena, Dan Sparks</i>	
An Analysis of the Internal Structure and its Development of Virtual Organizations in the Grid	203
<i>William Song, Xiaoming Li</i>	
Mobile Systems Development: Exploring the Fit of XP	215
<i>Ole Pedersen, Martin Lund Kristiansen, Marc Nyboe Kammergaard, and Jens Henrik Hosbond</i>	
Implementation of Server on Grid System: A Super Computer Approach	225
<i>Md. Ahsan Arefin, Md. Shiblee Sadik</i>	
Customizing Groupware for Different Collaborative Needs.....	237
<i>Igor Hawryszkiewicz</i>	
Proposal for a System Based on the Universal Design Approach for Providing Tourism Information by Linking RFID and GIS.....	247
<i>Akihiro Abe, Nobuyuki Maita, Yasunori Ooshida , Toru Kano</i>	
Industrial Automated Fingerprint-Based Identification System.....	259
<i>Paulius Zubavicius, Antanas Cenys, Lukas Radvilavicius</i>	
Database Architectures: Current Trends and their Relationships to Requirements of Practice	267
<i>Jaroslav Pokorný</i>	
The IT Culture as an Obstacle to the Adoption of an ERP: Case of a High-Tech SME	279
<i>Meissonier, R., Ph.D., Houzé, E., Ph.D, Belbaly, N., Ph.D.</i>	

An Analysis of Communication Technologies for Distributed Embedded Systems in Industrial Process Automation	291
<i>Pavel Rusakov and Dmitry Mikoyelov</i>	
How to Identify Objectives and Genres in E-Democracy Projects: Learning from an Action Case Study	303
<i>Øystein Sæbø</i>	
Replacing a Human Agent by an Automatic Reverse Directory Service	321
<i>Géza Németh, Csaba Zainkó, Géza Kiss, Gábor Olasz, László Fekete, Domokos Tóth</i>	
Topic Identification by the Combination of Fuzzy Thesaurus and Complexity Pursuit	329
<i>Sándor Szaszko, László T. Kóczy</i>	
Long-term Preservation of Electronic Information – A study of Seven Swedish Governmental Organizations	341
<i>Viveca Asproth</i>	
The Managing and Complex Querying of the Digital Medical Images Collections	349
<i>Liana Stanescu, Dumitru Dan Burdescu, Marius Brezovan</i>	
Semantic Execution of BPEL Processes	361
<i>Péter Martinek, Béla Szikora</i>	
MEO Ontology Infrastructure	369
<i>István Szakadát, Miklós Szóts, György Gyepesi</i>	
A Semantic-Based Web Service Composition Framework	379
<i>H-M. Haav, T. Tammet, V. Kadarpi, K. Kindel, M. Kääramees</i>	
Community-Based Partnerships in the Design of Information Systems: The Case of the Knowledge Commons	393
<i>Natalie Pang, Henry Linger, Don Schauder</i>	
ICT Solution and Network Capabilities Development: The Role of the Codification Process in the KMP Experience.	409
<i>Pierre-Jean Barlatier, Catherine Thomas</i>	
Ontology as an Information Base for a Family of Domain Oriented Portal Solutions	423
<i>Michal Barla, Peter Bartalos, Peter Sivák, Kristián Szobi, Michal Tvarožek, Roman Filkorn</i>	

Business Rules in Clinical Trials	435
<i>Olegas Vasilecas, Evaldas Lebedys</i>	
On Some Inferences Based on Stratified Forward Chaining: An Application to E-Government.....	447
<i>El-Hassan Bezzazi</i>	
Requirements Determination for Knowledge Management Systems in Information Technology Outsourcing Relationships.....	459
<i>Dolphy M. Abraham</i>	
Using Concept Maps in Adaptive Knowledge Assessment.....	469
<i>Alla Anohina, Vita Graudina, Janis Grundspenkis</i>	
Term Clustering and Confidence Measurement in Document Clustering	481
<i>Kristóf Csorba and István Vajk</i>	
Automation of the Ontology Axioms Transformation into Information Processing Rules Model.....	493
<i>Olegas Vasilecas, Diana Bugaite</i>	
Using Common Process Patterns for Semantic Web Service Composition	501
<i>Xiaofeng Du, William Song, Malcolm Munro</i>	
Categories Extraction for Reuse in Semantic Applications and Profile Based Recommendation Service.....	515
<i>Vytautas Taujanskas, Rimantas Butleris</i>	
Knowledge and Decision-Making within Software Projects.....	525
<i>Birinder Sandhawalialia, Darren Dalcher</i>	
Index	539

A Revised Perspective on Documentation Practices in the Modern Organisation

J. Coady, R. Pooley

Heriot-Watt University, School of MACS, Riccarton, Edinburgh.

Abstract: There are a number of reasons for the use of various methodologies in the development of systems (Broady, Walters & Hartley (1994)), notably a reduction in user dissatisfaction and more effective communication between systems developers and users. These reduce the risk of a new system being presented to its users as a fait accompli. The use of an appropriate modelling paradigm can produce a better end product, improved consistency and the likelihood of improved user acceptance.

Formal methodologies may be appropriate for more technical systems where fewer human factors are involved; however, they may be too mechanistic to be effective in detailed, day-to-day organization of developers' activities. Traditional methodologies can still be valuable in IS development projects in order to maintain an image of control or to provide symbolic status (Nandhakumar & Avison (1999)).

Hard methods, such as structured and object-oriented approaches, (Bocij et al. (1999)) focus on the Computer Based Information Systems as a technical artifact, which must satisfy a set of well-defined user requirements. According to Chekland & Howell (1998), organisational change and improvement can only be successful when the organisational actors are engaged in that change. The IS is increasingly being viewed as a social artifact, and researchers such as Stapleton (2001) and Dewar et al. (2003) highlight the need for a revised perspective on ISD to deal with this development. Coady (2003) showed that, while there is a body of work which is concerned with the social aspects of creating a technical artifact, very little work has investigated documenting the IS as a social artifact.

This paper presents an empirical study; which identifies those practices that academia suggests are the current industrial standards, compares the perceived standards to current practice in the organisations involved in the research and develops conclusions suggesting better industrial practice.

1 Introduction

Early computerized information systems were typically implemented without the use of an explicit development methodology (Broady, Walters & Hartley (1994)). As a result of early era problems developers of the 60's and 70's learnt a number

of lessons, which included the use of a life cycle, consisting of documentation, control and training, and that failings could be attributed to the narrowness of perspective of the analyst and the need for a real view of the organization. These lessons led to the development of many of the current methodologies (Broady, Walters & Hartley (1994)).

A system is an organized integrated unit that serves a common purpose, formed from diverse components (Ossenbrugen (1994)). There are many modelling notations available to analysts trying to simplify systems. Systems theory generally attempts to understand the nature of systems, which are large and complex. However, systems theory suggests that whatever methodology is adopted the analyst needs to look beyond the obvious boundaries and at the system as a whole. Information systems generically have human and computer elements and both aspects are inter-related. The technical aspects are closed and predictable, whereas the human aspects are often open and non-deterministic. The technological aspects are less complex than the human aspects in information systems, because the former are predictable in nature. Many information system methodologies only stress the technological aspects. This may lead to a solution, which does not work effectively, because often methodologies underestimate the importance and complexity of the human elements (Avison & Fitzgerald (1996)). This research study examines the problems of documenting systems and reviews the frameworks used within the firms studied for best practice in the light of what is known about IS documentation.

2 The need for a revised perspective of IS documentation

The concept of the learning organisation, as presented by Argyris & Schon (1996), is defined as a means to reflect upon, and re-evaluate the knowledge that is created by individuals within the organisational context. The organisation is changed as a result of this learning process. The learning process can be viewed as an ongoing sense making activity based on the collective knowledge of the individuals (Argyris (1976)). In this way the documentation of an organisation can help in the learning and development process and create a learning organisation by continuous re-evaluation and gathering of information.

According to Chekland & Howell (1998), organisational change and improvement can only be successful when the organisational actors are engaged in that change. By implication the area of IS documentation can also be affected by this change, whereby it is a necessity that the actors in a system are involved in the documentation and modelling process in order to ensure a compatible system. 90% of Information and Communication Technology (ICT) projects fail to meet their goals due to a misalignment of goals and organisational activities (Clegg et al. (1996)). IS documentation and development is supposed to consider organisational issues but too often IS is looked upon as a subsystem external or separate from the rest of the organisation. Bednar (1999) suggests a way of improving the disparate view of IS documentation and development is to view the organisation