

Information Systems Development

Information Systems Development

Towards a Service Provision Society

Edited by

GEORGE A. PAPADOPOULOS

*University of Cyprus
Nicosia, Cyprus*

GREGORY WOJTKOWSKI

*Boise State University
Boise, ID, USA*

WITA WOJTKOWSKI

*Boise State University
Boise, ID, USA*

STANISLAW WRYCZA

*University of Gdansk
Sopot, Poland*

JOZE ZUPANCIC

*University of Maribor
Kranj, Slovenia*



Springer

Editors

George A. Papadopoulos
Department of Computer Science
University of Cyprus
Nicosia 1678, Cyprus
george@cs.ucy.ac.cy

Gregory Wojtkowski
Department of Information Technology
College of Business and Economics
Boise State University
Boise, ID 83725-1615, USA
gwojtkow@boisestate.edu

Wita Wojtkowski
Department of Information Technology
College of Business and Economics
Boise State University
Boise, ID 83725-1615, USA
riswoj2t@cobfac.boise.state.edu
riswojt2@cobfac.idbsu.edu

Stanislaw Wrycza
Department of Information
Systems
University of Gdansk
Krajowej 119121, Poland
swrycza@univ.gda.pl

Joze Zupancic
University of Maribor
Kranj SI-4000, Slovenia
joze.zupancic@fov.uni-mb.si

ISBN 978-0-387-84809-9 e-ISBN 978-0-387-84810-5

DOI 10.1007/b137171

Springer New York Dordrecht Heidelberg London

Library of Congress Control Number: 2009932888

© Springer Science+Business Media, LLC 2009

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

Springer is part of Springer Science + Business Media (www.springer.com)

Preface

This two-volume book is the published proceedings of the 17th International Conference on Information Systems Development (ISD2008) that was hosted by the Department of Computer Science of the University of Cyprus at the Annabelle Hotel, Paphos, Cyprus, from 25–27 August 2008. The theme of the conference was “Towards a Service Provision Society”.

In total, 131 delegates from 34 different countries registered for the conference, making it a truly international event. Papers presented at the conference strongly reflected the conference theme. Of 165 papers submitted, 99 were presented at the conference, representing an acceptance rate of approximately 60%. All papers were peer reviewed by 3 or 4 referees (a total of 543 review reports were submitted, corresponding to an average of 3.29 reviews per paper).

Over the course of 3 days, 28 paper sessions were held, covering a range of areas such as “Information Systems Engineering & Management”, “Business Systems Analysis & Design”, “Intelligent Information Systems”, “Agile and High-Speed Systems Development Methods”, “Enterprise Systems Development & Adoption”, “Public Information Systems Development”, “Information Systems Development Education”, “Information Systems Development in Developing Nations”, “Legal and Administrative Aspects of Information Systems Development”, “Information Systems Research Methodologies”, “Service-Oriented Analysis and Design of Information Systems”, “IT Service Management”, “Philosophical and Theoretical Issues in Information Systems Development”, “Model-driven Engineering in ISD”, “Human Computer Interaction (HCI) in Information Systems Development”. The book is organised by order of the conference sessions.

While all the presented papers were of high quality, we have selected two of them to share the *Best Paper Award*. The first one is “Modeling the contribution of enterprise architecture practice to the achievement of business goals” by Marlies van Steenbergen and Sjaak Brinkkemper. The second one is “Why can’t we bet on ISD Outcomes?: ISD ‘Form’ as a Predictor of Success” by Mike Newman, Shan L Pan and Gary Pan. Furthermore, to acknowledge the quality of the reviews he completed, the quality of the paper he submitted, his role as a track and session chair, and his general participation in the conference, we have awarded an *Overall Contribution Award* to Michael Lang of the National University of Ireland, Galway. Details of these awards can be found on the conference Web site at <http://isd2008.cs.ucy.ac.cy>.

Our gratitude is extended first to all those who attended and authored work for the conference. The contribution of the International Program Committee was invaluable in identifying track chairs and reviewers to commit to doing vital work. While volunteering to host a conference is a highly personal undertaking, without support it would be impossible. Thus, we wish to thank our sponsors for their financial support and other aid.

The ISD conference community has developed over the years a real sense of collegiality and friendliness, perhaps unusually so for a conference. At the same time it has been a stimulating forum where a free exchange of views and perspectives is encouraged. Perhaps what brings the community together is a belief that the process of systems development is important; whether it is systematic or structured or improvised or spontaneous, there is something about the process and the outcomes that excites us. We form a spectrum of thought from those who see the activity as somewhat scientific to others that see it as wholly sociological; we span a divide between abstract and conceptual, to hard code and

artefacts – somewhere in-between lies the truth. If our work is to make a meaningful contribution to both practice (by teaching students) and research (by sharing our experiences and studies with others), then hopefully this conference will have done a little of the former and much for the latter.

George A. Papadopoulos
Gregory Wojtkowski
Wita Wojtkowska
Stanislaw Wrycza
Jozef Zupancic

Contents

1. Designing Class Methods from Dataflow Diagrams

Peretz Shoval and Judith Kabeli-Shani

1. Introduction	1
2. Overview of the Design Phase of FOOM	2
3. Transactions and Their Descriptions	3
3.1. What is a Transaction?	3
3.2. Top-Level Descriptions of Transactions	5
4. Detailed Design of Transactions and Class Methods	6
4.1. Steps in the Design of Transaction and Class Methods	6
4.2. From Top-Level to Detailed Transaction Descriptions	6
4.3. From Detailed Descriptions of Transaction to Class Methods	7
4.4. Message Charts	9
5. Summary	9
References	10

2. On The Human, Organizational, and Technical Aspects of Software Development and Analysis

Robertas Damaševičius

1. Introduction	11
2. Non-Technical Aspects of Software Development	12
2.1. Social Aspects	12
2.2. Organizational Aspects	12
2.3. Psychological Aspects	13
2.4. Cultural Aspects	13
3. Social Disciplines of Computer Science	13
4. Socio-Technical Software Analysis	15
4.1. Concept, Context, and Aims of Socio-Technical Software Analysis	15
4.2. Socio-Technical Software Analysis vs. Traditional Domain Analysis	15
5. Discussion and Conclusions	16
References	17

3. Toward Modeling Language-Independent Integration of Dynamic Schemata

Peter Bellström, Jürgen Vöhringer and Christian Kop

1. Introduction	21
2. Related Work	22
3. Guidelines for Language Independent Schema Integration	23
3.1. Phase 1 – Preparation of Source Schemata	23
3.2. Phase 2 – Recognition of Conflicts and Commonalities Between Source Schemata	24

3.3. Phases 3 and 4: Conflict Resolution and Schema Merging.....	24
4. Applying the Guidelines – A Motivating Example	25
4.1. The Applied Modeling Languages	25
4.2. Integrating Language-Independent Source Schemata	26
5. Summary and Conclusion	29
References	29

4. Improving Knowledge Management in the Health Service: Re-Engineering Approach Towards Successful Implementation

Regina Gyampoh-Vidogah and Robert Moreton

1. Introduction	31
2. Business Process Re-Engineering (BPR)	32
3. Knowledge Management (KM)	33
4. The Case Study	33
5. BPR Processes and Activities	35
5.1. Set Business Goals and Objectives for Implementing KM	36
5.2. Review Programme, Activities and Identify Communication Strategies	36
5.3. Estimate and Justify Cost for KM	36
5.4. Examine the Technical Challenges	36
5.5. ReDesign the Health-Care Project Management Process	37
5.5.1. Re-Engineer Towards IT Infrastructure	37
5.5.2. Consideration of KMS	37
5.6. Evaluate Change Management Issues	37
5.7. Implement the System	38
6. Limitations	38
7. Summary and Recommendations	38
8. Conclusion	38
References	39

5. Accounting, Charging and Billing for Dynamic Service Composition Chains

F.J. Rumph, G.H. Kruithof and G.B. Huitema

1. Introduction	41
2. ACB in Service Composition Chains	42
2.1. ACB in Static Service Composition Chains	43
2.1.1. Static Business Relationships	43
2.1.2. Static Service Composition Chains	43
2.1.3. ACB in Static Service Composition Chains	44
2.2. ACB in Dynamic Service Composition Chains	45
2.2.1. Dynamic Business Relationships	45
2.2.2. Dynamic Service Composition Chains	45
2.2.3. Impact on ACB in Dynamic Service Composition Chains	45
3. Dynamic Service Composition ACB Framework	46
3.1. Dynamic Service Composition Architecture	46
3.2. Framework Function Descriptions	47
3.2.1. Negotiation Layer	48
3.2.2. ACB Management Layer	48
4. Conclusion	48
References	48

6. Web Service Execution and Monitoring in Integrated Applications in Support of Business Communities*Rares M. Chiriacescu, Alexandru Szőke, Sorin Portase and Monica Florea*

1. Introduction	49
2. Basic Business Scenario	50
3. Conceptual Architecture	51
3.1. Integration Tools	52
3.2. Component Execution	53
3.3. System Monitoring	54
4. Implementation Aspects	55
5. Summary and Conclusions	56
References	56

7. Scrutinizing UML Activity Diagrams*Sabah Al-Fedaghi*

1. Introduction	59
2. The Flow Model	60
3. Some FM Features	60
4. Comparison of Some FM Features with UML	61
5. Conceptual Class Diagrams	63
6. Example of FM Capabilities: Exceptions in UML 2.0	65
7. Conclusion	67
References	67

8. Integration of Weakly Heterogeneous Semistructured Data*George Feuerlicht, Jaroslav Pokorný, Karel Richta and Narongdech Ruttananontsatean*

1. Introduction	69
2. Oceanographic Data Example	70
2.1. Querying Weakly Heterogeneous Data	71
3. Related Research	72
4. Proposed Approach	73
4.1. Query System Architecture	73
4.2. Mapping Schema	74
5. Conclusions and Future Work	77
References	77

9. Investigating the Applicability of Structural Analysis Techniques in Distributed Systems*Karen Hamber, Graham Low and Greg Stephens*

1. Introduction	79
2. Structural Analysis Techniques	80
2.1. Support from Structural Analysis Techniques	81
3. Application to Distributed Systems	82
3.1. Proposed Technique	82
3.2. Application of Proposed Technique	84
4. Conclusion	88
References	88

10. Web-Based Systems Development: Analysis and Comparison of Practices in Croatia and Ireland*Michael Lang and Dijana Plantak Vukovac*

1. Introduction	91
2. The Software Industry in Croatia and Ireland	92
3. Research Method	92
4. Findings and Discussion	94
4.1. Small Development Teams and Collective Knowledge	94
4.2. Project Management and Requirements Management	94
4.3. Development Processes and Procedures	96
4.4. Attitudes Towards Documented Plans	97
5. Conclusions	98
References	99

11. The Solution Space Organization: Linking Information Systems Architecture and Reuse*Salem Ben Dhaou Dakhli*

1. Introduction	101
2. The Software Reuse Paradigm: A Literature Review	102
3. The Software Global Model	103
4. The Solution Space Structure	105
4.1. A Layered Description of the Solution Space	105
4.2. The Reuse Approach	107
5. Conclusion and Future Research Directions	108
References	108

12. Designing Cognition-Adaptive Human–Computer Interface for Mission-Critical Systems*Yu Shi, Eric Choi, Ronnie Taib and Fang Chen*

1. Introduction	111
2. Literature Review	112
3. Design of Cognition-Adaptive Multimodal Interface (CAMI)	114
3.1. Motivation and Objectives	114
3.2. CAMI Design and Analysis	115
4. Multimodal Interface Development and Cognitive Task Analysis	117
5. Cognitive Load Analysis and Measurement	118
6. Conclusions and Future Work	118
References	119

13. Conceptual Web Users' Actions Prediction for Ontology-Based Browsing Recommendations*Tarmo Robal and Ahto Kalja*

1. Introduction	121
2. Related Works	122
3. Mining of Users' Interest Concepts for Predictions	123
3.1. Web Ontology	123
3.2. Extraction of Users' Interest Concepts into Prediction Model	124

4. Predictions on Sequential and Conceptual Models	125
4.1. Conceptual Distance Between Pages Accessed	126
4.2. Empirical Study of the Prediction Models	126
5. Conclusions	128
References	128

14. Web Portal Design: Employment of a Range of Assessment Methods

Andrina Granić, Ivica Mitrović and Nikola Marangunić

1. Introduction	131
2. Background to the Research	132
3. Study 1: Usability Testing	132
3.1. Research Design and Methodology	133
3.2. Results and Discussion of Findings	134
4. Study 2: Guideline-Based Inspection	135
4.1. Assessment Procedure	136
4.2. Results and Analysis	136
5. Conclusion and Future Steps	138
References	139

15. A Proposed Extension of the CODAM Model for Human Attention

Kleanthis C. Neokleous, Marios N. Avraamides, Andreas A. Ioannides, Costas K. Neocleous and Christos N. Schizas

1. Introduction	141
2. Control Theory Approach for Computational Modeling of Attention	142
3. Brief Description of the CODAM Model	142
4. Some Important Issues and Questions on Specific Characteristics of Attention	143
5. Proposed Modifications on the Attention Model	144
6. Discussion	146
References	146

16. Aligning Service Requirements with Business Strategy: A Proposed Stakeholder Value Model for SOA

H. Luthria, A. Aurum, G.C. Low and F.A. Rabhi

1. Introduction	149
2. Service-Oriented Requirements Engineering A Review	150
3. Applying a Value-Based Approach to Service Requirements	151
3.1. An Empirical Understanding of the Business Drivers for SOA	151
3.2. The Value Proposition of SOA	152
3.2.1. Strategic Value Proposition	152
3.2.2. Tactical Value Proposition	153
3.2.3. Operational Value Proposition	153
3.3. Proposing a Stakeholder Value Model for SOA	154
4. Contributions and Future Research	155
References	156

17. A New Method for Conceptual Modelling of Information Systems

Remigijus Gustas and Prima Gustiene

1. Introduction	157
2. Intersubjective and Objective View in System Analysis	158
3. Integration of Static and Dynamic Aspects	160
4. Service-Oriented Modelling of Information Systems	162
5. Concluding Remarks	164
References	165

18. Using ESB and BPEL for Evolving Healthcare Systems Towards Pervasive, Grid-Enabled SOA

V. Koufi, F. Malamateniou, D. Papakonstantinou and G. Vassilacopoulos

1. Introduction	167
2. A System Evolution Process	168
3. Motivating Scenario	170
4. System Architecture	171
5. Security Framework	173
5.1. Access Control Mechanism	173
5.2. Context Information Management	174
6. Concluding Remarks	174
References	175

19. MISS: A Metamodel of Information System Service

Nicolas Arni-Bloch and Jolita Ralyté

1. Introduction	177
2. Information System Service	178
2.1. Static Space	179
2.2. Dynamic Space	180
2.3. Rule Space	181
3. Examples of ISS	181
4. Modularity and Autonomy of ISS	183
5. Positioning and Future Work	184
6. Conclusion	185
References	185

20. An Examination on Service Science: A View from e-Service

William Song and Deren Chen

1. Introduction	187
2. A Structure for Service Science	189
2.1. Representative Concepts	190
2.2. Four Subtopics from the Four Parts	191
2.3. Interdependencies Among the Four Parts	191
3. Context of Service Science	192
3.1. Service Interoperability	192
3.2. Service Management and Quality Control	193
4. Conclusion	193
References	195

21. Mapping SOA Artefacts onto an Enterprise Reference Architecture Framework*Ovidiu Noran*

1. Introduction	197
2. The Reference Framework	198
3. Mapping Typical SOA Artefacts on the Reference Framework	199
3.1. SOA Ontologies	199
3.2. SOA Metamodels	199
3.3. SOA Reference Models and Reference Architectures	200
3.4. SOA Modelling/Documentation Framework	200
3.5. SOA Life Cycle and Service Life Cycle	201
3.6. SOA Vision	202
3.7. SOA Governance	203
3.8. The SOA Team	203
3.9. SOA Methodologies	203
3.10. SOA Quality of Service and Quality Control	203
3.11. Enterprise Service Bus and Policies	204
4. Conclusions and Further Work	204
References	204

22. Comparing Architectural Styles for Service-Oriented Architectures – a REST vs. SOAP Case Study*Jörg Becker, Martin Matzner and Oliver Müller*

1. Motivation and Outline	207
2. Case Study	208
3. SOAP-Style architecture	210
4. REST-Style Architecture	211
5. Evaluation and Outlook	214
References	215

23. A Method for Transforming Existing Web Service Descriptions into an Enhanced Semantic Web Service Framework*Xiaofeng Du, William Song and Malcolm Munro*

1. Introduction	217
2. Enhanced CbSSDF (CbSSDF+)	218
3. Transformation Method	220
3.1. Step One: Ontology-Based Service Classification	220
3.2. Step Two: CUPs generation	221
3.3. Step Three: S-CGs Generation	221
3.4. An Illustrative Example	222
4. Evaluation	223
5. Conclusion	225
References	226

24. An Extensible ADL for Service-Oriented Architectures*R. Bashroush and I. Spence*

1. Introduction	227
2. Meta Types	228

3. Interface Types	229
4. Connector Types	230
5. Component Types	231
6. Pattern Templates	234
7. Features	234
8. System	235
9. Discussion	236
References	236

25. Specification and Verification of an Agent-Based Auction Service

Amelia Badica and Costin Badica

1. Introduction	239
2. Agent Negotiation Model	240
3. FSP Model of Agent Negotiation	242
3.1. Overview of the Modelling Approach	242
3.2. Auction Host	243
3.3. Auction Service Host	244
3.4. Buyer and Seller Roles	245
3.5. System with Buyers, Sellers and an Auction Service	245
4. Modelling System Properties	246
5. Conclusions and Future Work	247
References	247

26. A Practical Environment to Apply Model-Driven Web Engineering

Maria Jose Escalona, J.J. Gutiérrez, F. Morero, C.L. Parra, J. Nieto, F. Pérez, F. Martín and A. Llergo

1. Introduction	249
2. The Methodology	250
2.1. Métrica v3	250
2.2. NDT – Navigational Development Techniques	251
2.3. A Practical Combination Between Métrica v3 and NDT	252
3. Tool Support	253
3.1. NDT-Profile	253
3.2. CADI	254
4. The Practical Experience: The Diraya Project	255
5. Conclusions and Future Works	256
References	257

27. An Approach to Generating Program Code in Quickly Evolving Environments

Linas Ablonskis

1. Introduction	259
2. Related Works	260
3. Properties and Limitations of Standard Approach to Generating Program Code from Abstract Program Models	261
4. Analysis of Information Required to Configure Program Code Generator	262
5. Properties of Program Code Exploited by Program Code Generators	262
6. An Approach to Generating Program Code in Quickly Evolving Environments	263

7. A Method Proposal for the Structural Part of the Program Model	264
8. Conclusions and Future Work	265
References	266

28. Devising a New Model-Driven Framework for Developing GUI for Enterprise Applications

Pierre Akiki

1. Introduction	269
2. Presentation Technologies	270
3. Diverse Presentation Technology Dilemma	273
4. Customizable Enterprise Data Administrator (CEDAR)	273
4.1. CEDAR Development Technology	274
4.2. CEDAR Presentation Designer	274
4.3. CEDAR Data Storage	274
4.4. CEDAR Application Architecture	275
4.5. CEDAR Designer Essentials	275
4.6. Technology-Specific Generation	278
5. Conclusion and Future Work	278
References	278

29. Model-Driven Development of Decision Support Systems: Tackling the Variability Problem

Maria Eugenia Cabello and Isidro Ramos

1. Introduction	281
2. Variability	282
3. Variability Management in BOM	283
3.1. The First Variability in BOM	285
3.2. The Second Variability in BOM	285
4. Model Transformations in BOM	286
5. Conclusions and Future Work	287
References	287

30. Foundations on Generation of Relationships Between Classes Based on Initial Business Knowledge

Oksana Nikiforova and Natalya Pavlova

1. Introduction	289
2. Aggregation	291
3. Dependency	293
4. Generalization	295
5. Conclusions	296
References	297

31. Expert Systems Development Through Software Product Lines Techniques

Maria Eugenia Cabello and Isidro Ramos

1. Introduction	299
2. Foundations	300

3. The Architecture of the Expert Systems.....	300
3.1. The Variability in the Architecture of the Expert Systems.....	301
3.1.1. Variability in the Expert Systems Structure.....	301
3.1.2. Variability in the Expert Systems Behavior.....	302
4. Variability Management in BOM	304
5. Expert Systems Development in BOM	305
6. Conclusions and Future Work.....	306
References	306

32. Framework for Using Patterns in Model-Driven Development

Picek Ruben and Strahonja Vjeran

1. Introduction	309
2. Model-Driven Development Paradigm and Software Patterns Overview.....	309
2.1. Model-Driven Development Paradigm.....	309
2.2. Software Patterns	310
2.2.1. Definition and Characteristics of Patterns.....	310
2.2.2. Pattern Classification and Standardization	311
3. Conditions for Using Patterns in MDD	311
4. Framework Development	312
4.1. Pattern Identification	313
4.2. Pattern Development.....	314
4.3. Pattern Use	315
4.4. Pattern Management.....	316
5. Conclusions	316
References	317

33. Ontology of Domain Analysis Concepts in Software System Design Domain

Robertas Damaševičius

1. Introduction	319
2. Domain Ontology Engineering: Concepts, Aims, and Definitios	320
3. Domain Concepts in Known DA Approaches	321
4. Domain Taxonomy and Ontology.....	323
5. Taxonomy of Domain Analysis Concepts	325
6. Conclusions and Further Work	326
References	326

34. An Anonymity Revocation Technology for Anonymous Communication

Giannakis Antoniou, Lynn Batten and Udaya Parampalli

1. Introduction	329
2. Current Work in the Area of Anonymity Revocation Technologies.....	330
3. Principles of an Anonymity Revocation Technology	330
4. Requirements of an Anonymity Revocation Technology	331
5. Analysis of an Anonymity Revocation Technology	333
6. Analysis of the Existing ARTs Based on the Requirements	334
7. Discussion	335
8. Conclusion and Future Work	336
References	336

35. The Fight Against Piracy in Peer-to-Peer Networks: the Sword of Damocles Hanging over ISP's Head?*Evi Werkers Fanny Coudert*

1. Introduction	339
2. The Role of ISPs as Neutral Intermediaries Endangered?	340
2.1. Developments in European Member States	340
2.2. Developments on European Level	341
3. The Danger of Private Censorship	341
4. The Protection of the Secrecy of Communications	342
4.1. Looking for an Appropriate Legal Ground: An Analysis of Article 15(1) of the E-Privacy Directive	343
4.2. The Existence of a Pressing Social Need	343
4.3. The Principle of Proportionality	344
5. Conclusion	345
References	346

36. Information Technology Projects – Leaving the ‘Magic’ to the ‘Wizards’*Peter M. Bednar and Christine Welch*

1. In Search of the Magic Wand	349
2. A Cloak of Invisibility	351
3. Conclusions	354
References	355

37. Analysis of Academic Results for Informatics Course Improvement Using Association Rule Mining*Robertas Damaševičius*

1. Introduction	357
2. Principles of Association Rule Mining and Rule Metrics	358
3. Framework for Educational Data Mining Using Association Rules	359
4. Case Study: Mining Association Rules in “Object-Oriented Programming” Course	360
5. Conclusion and Future Work	362
References	362

38. The Automatic Integration of Folksonomies with Taxonomies Using Non-axiomatic Logic*Joe Geldart and Stephen Cummins*

1. Introduction	365
2. The Problem of Integration	366
3. An Approach to Tagging with Non-axiomatic Logic	367
4. Experiment	369
5. Evaluation	370
6. Conclusions	371
References	372

39. Using Rules in an ‘Intelligent’ Information Retrieval Environment

Gian Piero Zarri

1. Introduction	373
2. A Rule System for ‘Intelligent’ Information Retrieval	375
2.1. Some Information about NKRL	375
2.2. General Principles about ‘Reasoning’ in NKRL	377
2.3. Some Additional Details	378
2.4. Integrating the Two Inference Modes of NKRL	379
3. Conclusion	380
References	381

40. Genetic Programming Modeling and Complexity Analysis of the Magnetoencephalogram of Epileptic Patients

Efstratios F. Georgopoulos, Adam V. Adamopoulos and Spiridon D. Likothanassis

1. Introduction	383
2. Genetic Programming	385
3. Results	386
4. Conclusions	390
References	390

41. A Three-Layer Approach to Testing of Multi-agent Systems

Tomas Salamon

1. Introduction	393
1.1. Three-Layer Approach	394
2. First Layer – Unit Testing	394
2.1. Stochastic Approach	395
2.2. Agent’s Perception	396
3. Second Layer – Testing of Agent Interactions	396
4. Third Layer – Testing of the Whole System	398
4.1. System Bottlenecks	398
4.2. System Stability during Mass Crashes of Agents	398
5. Conclusions and Future Work	399
References	400

42. Risk Analysis Based Business Rule Enforcement for Intelligent Decision Support

Olegas Vasilecas, Aidas Smaizys and Ramunas Brazinskas

1. Introduction	403
2. Related Works	404
3. A Method for Decision Automation Using Risk Analysis Based Business Rule Enforcement	406
4. Experimental Validation of the Method Using XForms	408
5. Conclusions	409
References	411

43. Sound Processing Features for Speaker-Dependent and Phrase-Independent Emotion Recognition in Berlin Database*Christos Nikolaos Anagnostopoulos and Eftichia Vovoli*

1. Introduction	413
2. Basic Emotions	414
3. Sound/Speech Features	415
3.1. Sound Feature Selection	416
3.2. Calculation of Sound Features	417
4. Classification	418
4.1. Utterance-Dependent Emotion Recognition	418
4.2. Utterance-Independent Emotion Recognition	419
5. Conclusion and Future Work	419
References	420

44. An Approach for Implementation of Project Management Information Systems*Solvita Bērziša and Jānis Grabis*

1. Introduction	423
2. State of Art	424
2.1. Project Management Methodologies	424
2.2. Project Management Information System	425
2.3. Implementation of COTS Systems	425
3. Approach	425
4. Project Management Methodology Specification	426
5. Sample Application	429
6. Conclusion	431
References	431

45. From Standard Application Packages to Enterprise Systems – A Matter of Opportunities*Anders G. Nilsson*

1. Historical Review	433
2. Standard Application Packages	434
3. Enterprise Systems	434
4. Opportunities	435
4.1. Function Quality vs. Integration Quality	435
4.2. Customer-Driven Work vs. Vendor-Driven Work	436
4.3. Component View vs. Portfolio View	436
4.4. Expandability vs. Adaptability	437
4.5. Promoting System Concept vs. Controlling System Concept	437
5. The Connection	438
References	439

46. The Total Picture – A Framework for Control of IT Investments*Mats-Åke Hugoson, Björn Johansson and Ulf Seigerroth*

1. Introduction	441
2. Research Method and Project Setting	442

3. Proposed Framework	443
3.1. The Project Level in the Framework	443
3.1.1. Different Types of Benefits	444
3.1.2. Principles of the Framework	444
3.2. The Total Picture Level in the Framework	445
3.2.1. The Total Picture – from a Cash Flow Perspective	445
4. Discussion: Applying a Lifetime Perspective and a Total Picture to Control IT Investments	446
5. Conclusions and Future Research	447
References	448

47. Design Patterns Application in the ERP Systems Improvements

Bojan Jovičić and Siniša Vlajić

1. Introduction	451
2. Review of Business Functionalities Analysis	452
3. Analysis of Ease of Maintenance and Design Patterns Usage	452
3.1. Analysis of Combined Results	453
3.1.1. Design Patterns Familiarity	454
4. Analysis of Existing Patterns in Dynamics AX	454
4.1. Strategy	454
4.1.1. Intent	454
4.1.2. Application in Dynamics AX	454
4.2. Iterator	455
4.2.1. Intent	455
4.2.2. Application in Dynamics AX	455
4.3. Template Method	456
4.3.1. Intent	456
4.3.2. Application in Dynamics AX	456
5. Improvement Possibilities for Dynamics AX Using Design Patterns	456
5.1. Software Metrics	456
5.2. Example in Dynamics AX	457
6. Conclusions	459
References	459

48. Determinants of Open Source Software Adoption – An Application of TOE Framework

Tomasz Przechlewski and Krystyna Strzała

1. Introduction	461
2. Research on IT Adoption and Implementation	462
3. Conceptual Model of Open Source Adoption	463
4. Research Method, Survey Design, and the Sample Description	464
5. Estimation of the TOE Model	466
6. Summary	468
References	468

49. Hybridization of Architectural Styles for Integrated Enterprise Information Systems

Lina Bagusyte and Audrone Lupeikiene

1. Introduction	471
2. Component-Based Integrated Enterprise Information System	472

3. Service-Oriented Architecture: Characteristics and Open Questions	473
4. Hybrid Architecture for Integrated Enterprise Information Systems	475
4.1. Components and Services as Architecture Level Concepts.....	475
4.2. Main Architectural Decisions to Build IEIS.....	475
4.3. Using SysML for IEIS Architectural Modeling	477
5. Concluding Remarks	478
References	478

50. Proposing a Formalised Model for *Mindful* Information Systems Offshoring

Gabriel J. Costello, Chris Coughlan, Brian Donnellan and Andreas Gadatsch

1. Introduction	481
2. Background and Motivation	482
2.1. Offshoring: The Case of Ireland and Germany.....	482
2.2. Literature Context.....	482
3. Research Framing	483
3.1. Theoretical Considerations	483
3.2. Research Approach	483
4. Towards a Mindful Offshoring Model.....	484
4.1. Mindless Offshoring Equation	484
4.2. Mindful Offshoring Equation	484
5. Analysis and Suggestions	485
5.1. Possible Endogenous Variables.....	485
5.2. Offshoring Coefficient	485
5.3. Elasticity Analysis of the Equation Parameters	486
6. Discussion	487
6.1. Assignment of Values to the Parameters.....	487
6.2. Implications for Theory and Practice	487
6.3. Limitations and Suggestions for Future Work	487
7. Conclusions	488
References	488

51. Negotiating a Systems Development Method

Fredrik Karlsson and Karin Hedström

1. Introduction	491
2. Research Design.....	492
2.1. Theoretical Underpinnings	492
2.2. Case Description and Data Collection	493
3. The Negotiating Process of Method Tailoring	494
3.1. Negotiation 1 – Basic Principles	494
3.2. Negotiation 2 – Storyboards	495
3.3. Negotiation 3 – Bug Report Template	495
3.4. Negotiation 4 – Standardization of Web Page Template Documentation	497
4. Reflections on Method Tailoring as Negotiation	497
5. Conclusion	498
References	498

52. A Hybrid Peer-to-Peer Solution for Context Distribution in Mobile and Ubiquitous Environments

Xiaoming Hu, Yun Ding, Nearchos Paspallis, Pyrros Bratskas, George A. Papadopoulos, Yves Vanrompay, Manuele Kirsch Pinheiro and Yolande Berbers

1. Introduction	501
2. A Hybrid Peer-to-Peer Based Context Distribution System	502
2.1. A Hybrid Peer-to-Peer Infrastructure for Context Distribution.	503
2.2. Context Network and Distribution Service	504
2.3. Scope of Context Distribution	505
3. Comparison with Related Work	506
4. Evaluation	507
5. Conclusions	509
References	509

53. Rules Transformation Using Formal Concept Approach

Darius Jurkevicius and Olegas Vasilecas

1. Introduction	511
2. Related Works	512
3. Understanding of Formal Concept Analysis	512
4. Process of Rule Transformation	513
5. Storage of Formal Concepts in Formal Context and Experiment Overview.	516
6. Discussions	517
7. Conclusions	518
References	518

54. Agreements in Virtual Organizations

Małgorzata Pankowska

1. Virtualization	519
2. Virtual Organizations and Their Development	520
3. Virtual Organizations' Management Problems	522
4. Virtual Organization's Evaluation by Contracts and Agreements	523
5. Conclusions	525
References	525

55. Applying Utility Functions to Adaptation Planning for Home Automation Applications

Pyrros Bratskas, Nearchos Paspallis, Konstantinos Kakousis and George A. Papadopoulos

1. Introduction	529
2. Motivating Scenario.	530
3. System overview	531
3.1. Device and Service Discovery	531
3.2. Configuration Plans	532
3.3. User Preferences	533
3.4. Utility Functions	533
4. Evaluation	534
4.1. Case Study Example	534
5. Related Work	535

6. Conclusions	536
References	536

56. Current Trends in Testing XMLMSs

Irena Mlynkova

1. Introduction	539
2. Overview of Existing Approaches	540
2.1. XML Data Sets	540
2.2. XML Data Generators	540
2.3. Parsing and Validating XML Data	541
2.3.1. XML Conformance Test Suites	541
2.3.2. XML Parsers	541
2.4. Querying XML Data	542
2.4.1. Analysis of Benchmarking Projects	544
2.4.2. Benchmark Repository	544
2.5. Transforming, Updating and Other Operations with XML Data	544
3. Summary	545
4. Conclusion	546
References	546

57. Service-Oriented Software Development Value Chain and Process

Yuan Rao, Shumin Lu and ZhiXiong Yang

1. Introduction	549
2. Service-Oriented Reusable Software Development Process	550
3. Value Chain Model of Service-Oriented Software Process	551
3.1. Meta-Model of Value Chain	551
3.2. Value Chain-Based Software Development Process	551
3.3. The Establishment of SDVC Based on Different Processes	552
4. Value Chain Analysis of Software Development Process	555
5. Related Work	557
6. Conclusion	557
References	558

58. A Content Markup Language for Data Services

Noviello C., Acampa P. and Mango Furnari M.

1. Introduction	559
2. Octapy3 a Distributed and Cooperative Content Management System	560
3. OCML Specification	563
4. The Museo Virtuale Test Bed	566
5. Conclusions	567
References	567

59. Organizational Learning Literature Visited – Fresh Lenses to Study Practices in ISD Organizations?

Pasi Juvonen and Päivi Ovaska

1. Introduction	569
2. Organizational Learning Literature	570

2.1. Concepts and Terminology	570
2.2. Literature in IS Discipline	570
2.3. Literature in Other Disciplines	571
2.4. Classification of Organizational Learning Literature	571
3. Research Process and Revisited Empirical Data	571
4. Observations on Empirical Data	573
5. Discussion	574
6. Summary and Future Work	575
References	576

60. Contract Negotiations Supported Through Risk Analysis

Sérgio A. Rodrigues, Marco A. Vaz and Jano M. Souza

1. Introduction	579
2. Risk Management	580
3. The Negotiation Process	582
4. IT Contract Negotiation	583
5. Case Study and Results	584
5.1. Negotiation Context	584
5.2. Using RisNeg in the Negotiation	584
5.3. Results	586
6. Conclusions	586
References	587

61. Instantiating Software Processes: An Industry Approach

Peter Killisperger, Georg Peters, Markus Stumptner and Thomas Stückl

1. Introduction	589
2. Related Work	590
3. The Siemens Software Processes	591
4. Standardized and Semi-automated Instantiation of Processes	593
4.1. Implementation of the Approach	594
4.2. Use Case “Inserting a Milestone”	595
4.3. Evaluation of the Approach	596
5. Conclusion	597
References	597

62. A Language for Modelling Trust in Information Systems

Kamaljit Kaur Bimrah, Haralambos Mouratidis and David Preston

1. Introduction	599
2. Related Work	600
3. A Modelling Language for Trust	601
3.1. Modelling Language Concepts	601
3.2. Links/Associations	603
3.3. Modelling Language Graphical Notation	603
4. Case Study	606
5. Conclusions and Future Work	607
References	607

63. Modeling the Contribution of Enterprise Architecture Practice to the Achievement of Business Goals*Marlies van Steenbergen and Sjaak Brinkkemper*

1. Effectiveness of Enterprise Architecture	609
2. The Architecture Effectiveness Model	610
3. Three Applications of the AEM Concept	612
3.1. Case 1: A Municipality	612
3.2. Case 2: A University of Professional Education	613
3.3. Case 3: A Financial Institution	614
4. Discussion	615
5. Evaluation and Conclusions	616
References	617

64. Organizational Culture and ISD Practices: Comparative Literature Review*Päivi Ovaska and Pasi Juvonen*

1. Introduction	619
2. Community of Practice and Organizational Culture	620
3. Overview of Three Communities of Practice	620
4. Comparative Analysis	621
4.1. Analytic Framework for Comparisons	621
4.2. Business Milieu	621
4.3. Team Efforts	622
4.4. Software Development Approaches	623
4.5. Products and Quality	623
5. Discussion	624
6. Conclusions	625
References	625

65. Metadata to Support Data Warehouse Evolution*Darja Solodovnikova*

1. Introduction	627
2. Related Work	627
3. Data Warehouse Evolution Framework	628
4. Data Warehouse Metadata	628
4.1. Logical Metadata	629
4.2. Physical Metadata	630
5. Evolution Support	630
5.1. Physical Changes	631
5.2. Logical Changes	632
6. Conclusions and Future Work	634
References	634

66. The Morning After: What Happens When Outsourcing Relationships End?*Hamish T. Barney, Graham C. Low and Aybüke Aurum*

1. Introduction	637
2. Reported Findings on Sourcing Decisions	639
2.1. Related Research	639

3. Proposed Model	640
4. Model Applied to Case Study	642
5. Conclusion and Future Work	643
References	643

67. Method Engineering: A Formal Description

Ali Sunyaev, Matthias Hansen and Helmut Krcmar

1. Introduction	645
2. Research Approach	646
3. Description of the Method Elements	646
3.1. Method Chains and Alliances	647
3.2. Method Fragments	647
3.3. Method Chunks	648
3.4. Method Components	648
4. Formal Description of the Concept of Method	648
5. Application of the Formal Description	650
6. Summary and Outlook	653
References	654

68. A Methodological Framework for Enterprise Information System Requirements Derivation

Albertas Caplinskas and Lina Paškevičiūtė

1. Introduction	655
2. Related Works	656
3. The Proposed Methodological Framework	657
4. Conclusions	663
References	663

69. Measuring Communication Heterogeneity Between Multiple Web-Based Agents

Maricela Bravo and Martha Coronel

1. Introduction	665
2. Related Works	666
3. Measuring Heterogeneity	666
4. Case Studies	668
4.1. Case One. Measuring Communication Heterogeneity with Three Agents	668
4.2. Case Two. Measuring Communication Heterogeneity with Eight Agents	669
5. Evaluation of Results	671
6. Conclusions	672
References	673

70. Requirements Modeling with Agent Programming

Aniruddha Dasgupta, Aneesh Krishna and Aditya K. Ghose

1. Introduction	675
2. Background	676
2.1. The i* Framework	676
2.2. CASO	676
3. Modeling Softgoals as Preferences in i*	677

4. A Methodology for Combined Use of the i* and CASO Frameworks	678
5. Case Study: Meeting Scheduling Process	679
5.1. Building i* Models for Meeting Scheduler	679
5.2. Developing the Initial CASO Model	679
5.3. Validating and Refining the CASO Model by Simulation	681
5.4. Refining i* and CASO Models Based on Validation Results	682
6. Conclusion	682
References	682

71. BPMN, Toolsets, and Methodology: A Case Study of Business Process Management in Higher Education

Balbir S. Barn and Samia Oussena

1. Introduction	685
2. Motivation for This Chapter	686
3. Background and Related Work	686
4. Approach Taken	688
5. Case Study	688
5.1. Experimentation with UML Activity Diagrams and BPEL	689
6. Results and Evaluation	690
7. Conclusion	692
References	693

72. Incorporating Spatial Data into Enterprise Applications

Pierre Akiki and Hoda Maalouf

1. Introduction	695
2. Spatial Data Usage in Enterprise Applications	696
3. Spatial Data Support in Commercial Relational Database Management Systems	696
4. The Open Geospatial Consortium (OGC)	697
5. Spatial Data Visualization in Enterprise Applications	698
6. Spatial Extensions (SPEX)	699
6.1. SPEX Development Technology	699
6.2. SPEX Visual Components	699
6.3. SPEX Vague Spatial Data Support	701
7. Conclusion	703
References	704

73. The Development of Mobile Services – The Impact of Actor Groups in the Standardization Process

Endre Grøtnes and Steinar Kristoffersen

1. Introduction	705
2. A Framework for Showing Standardization Involvement	706
3. Our Framework and Research Methods	707
4. Findings – Presentation of the Data	709
4.1. Technological Strength – The Number of Essential IPR	709
4.2. The Depth Metric – Number of Chairs and Editors	709
4.3. The Openness Metric – Number of Proposals Supported	710
4.4. The Efficiency Metric – Two Cases	710

4.4.1. Mobile E-mail.....	710
4.4.2. Push to Talk Over Cellular (POC).....	711
4.5. Summary of Our Metrics	711
5. General Observation and Discussion.....	712
6. Conclusion	713
References	713

74. Reducing Health Cost: Health Informatics and Knowledge Management as a Business and Communication Tool

Regina Gyampoh-Vidogah, Robert Moreton and David Sallah

1. Introduction	715
1.1. Research Approach.....	716
1.2. Knowledge Management in the Medical Health Informatics Service of Business	716
2. Health Informatics and Evidence-Based Medicine	716
3. The Role of Health Informatics in Knowledge Management Environment	717
4. Cutting Health Service Costs	718
5. Information Technology and Information System Use.....	719
5.1. Strategy	719
5.2. Using Technology	719
5.3. Knowledge Management Culture	719
5.4. Management	719
5.5. Processes	719
5.6. Ongoing Maintenance and Protection	719
6. Recommendation	720
7. Summary and Further Research	720
References	721

75. The Information Architecture of E-Commerce: An Experimental Study on User Performance and Preference

Wan Abdul Rahim Wan Mohd Isa, Nor Laila Md Noor and Shafie Mehad

1. Introduction	723
2. Research Framework	724
2.1. Conceptual Model.....	724
2.2. Research Questions.....	725
3. Research Method	726
3.1. Subjects	726
3.2. Experimental Web sites.....	726
3.3. Experimental Design and Procedure.....	727
4. Research Framework	728
4.1. Experimental Result	728
4.2. Post-Study Result	729
5. Conclusions	730
References	730

76. Computer Literacy of Population 50+ – A Case from Slovenia

Barbara Vogrinec

1. Introduction	733
2. The CLP Project and the PIG Project	733

2.1. The CLP Project	733
2.2. The PIG Project	735
3. Conclusions	736
References	736

77. A Taxonomy of E-Health Standards to Assist System Developers

Emma Chávez, Padmanabhan Krishnan and Gavin Finnie

1. Introduction	737
2. Background and Evolution of E-Health Standardization	738
2.1. Principal Standards and Stakeholders	738
2.2. E-Health Standardization Problems	739
2.3. Software Development Standards in E-Health	740
2.4. E-Health Standards' Main Categories	740
3. The Taxonomy	741
3.1. Taxonomy Domains	741
4. E-Health Standards Classification	742
5. Conclusions	742
References	744

78. Mobile Location-Based Services for Trusted Information in Disaster Management

Lemonia Ragia, Michel Deriaz and Jean-Marc Seigneur

1. Introduction	747
2. System Architecture	748
3. System Security	750
4. Trust in the System	751
5. Implemented Prototype	751
6. Conclusions	752
References	753

79. Resolution of Complexity in ISD Projects

Jill Owen and Henry Linger

1. Introduction	755
2. Complexity in ISD Projects	756
3. A Theoretical Framework for ISD Complexity	756
4. Research Approach	757
5. Case Study – Rollout of an Enterprise Project Management Software in a Government Department	758
5.1. Department XYZ	758
5.2. The Third Party – Primavera Australia	759
5.3. The Project	759
6. Discussion	760
6.1. Addressing Complexity	761
7. Conclusion	762
References	762

80. Business Architecture Development at Public Administration – Insights from Government EA Method Engineering Project in Finland*Katariina Valtonen and Mauri Leppänen*

1. Introduction	765
2. CASE: The GEA Method Engineering Project	766
3. Research Method	768
4. Results	768
4.1. E-Government Business Models	768
4.2. Customer-Driven Development	769
4.3. Business Process Modeling	770
5. Implications	771
6. Conclusion	772
References	773

81. A Standardization Framework for Electronic Government Service Portals*Demetrios Sarantis, Christos Tsiakalidis, Fenareti Lampathaki and Yannis Charalabidis*

1. Introduction	775
2. The Driving Force	776
3. State of the Art	777
4. The Greek Standardization Framework	778
5. Application of the Standardization Framework	780
5.1. The Case of Civil Personnel Selection Portal	780
5.2. The Case of Fireservice Portal	781
6. Conclusions	782
References	783

82. Elaborating the WARE Method for eParticipation Requirements*Øystein Sæbø, Tero Pääväranta, Jan Helge Austbø and Svein Sundfør Scheie*

1. Introduction	785
2. eParticipation	786
3. Wide Audience Requirement Engineering (WARE)	786
4. Implementing the WARE Method in an eParticipation Project	787
5. Developing Requirement Design Interface to Support “Ongoing Activities”	789
6. Discussion	791
6.1. Suggested Improvements to the WARE Method	791
7. Conclusion	792
References	792

83. Web Tools for Geospatial Data Management*Petr Horák, Karel Charvat and Martin Vlk*

1. Introduction	793
2. Objectives	794
3. Methodology	794
4. Technology Description	795
5. Developments and Results	796

5.1. Generation of Map Compositions	796
5.2. Example of composition	797
5.3. Integration with Other Web Tools	798
5.4. Examples of Other Tools Integrated into URM Portals	798
5.4.1. Metadata Extractor	798
5.4.2. Moodle	798
5.4.3. Video Lecture	799
6. Business Benefits	799
7. Conclusions	799
References	800

84. Exploring the Role of Method Rationale in the Context of Teaching Information Systems Development Methods

Kai Wistrand, Fredrik Karlsson and Pär J. Ågerfalk

1. Introduction	801
2. Theoretical Framework	802
2.1. Method rationale	802
2.2. Method Components	803
2.2.1. The Internal View	803
2.2.2. The External View	803
3. Research Approach	804
4. Lectures	804
4.1. G1 Lectures	804
4.2. G2 Lectures	805
5. Modelling Seminars	805
5.1. G1 Modelling Seminar	806
5.2. G2 Modelling Seminar	806
6. Interviews	806
6.1. G1 Interviews	807
6.2. G2 Interviews	807
7. Concluding Discussion	807
References	808

85. Four Levels of Moral Conflict in ISD

Tero Vartiainen

1. Introduction	811
2. Information Systems Development	812
3. Four Levels of Moral Conflict in ISD	812
3.1. Intentional Level	813
3.2. Functional Level	813
3.3. Managerial Level	814
3.4. Societal Level	815
4. Theories Describing the Internal Structure of Moral Conflicts	816
4.1. A Philosophical Theory	816
4.2. Three Normative Theories of Business Ethics	816
4.3. An Exemplary Application of the Theories	817
5. Discussion	817
References	818

86. Specification of Learning Content Using Feature Diagrams

Robertas Damaševičius

1. Introduction	821
2. Use of Graphical Modeling Languages in Educational Domain.	822
3. Features, Feature Modeling, and Feature Diagram	823
4. Motivation of Using Feature Diagrams for LO Domain	824
5. Capabilities and Limitations of Feature Diagrams in Learning Object Domain	825
6. Case Study: A Learning Object for Teaching Shift Registers	826
7. Conclusions	828
References	828

87. Understanding Service-Oriented Architectures in the Classroom: From Web Services to Grid Services

D. Petcu and V. Iordan

1. Introduction	831
2. SOA Education	832
2.1. Importance of SOA Education	832
2.2. Requirements of SOA Education	832
2.3. Initiatives for SOA Education.	833
2.4. Comments on the Current Content of SOA Education	833
3. Web Service Education	835
3.1. Importance of Web Services for SOA Education	835
3.2. Initiatives for Web Service Education.	835
3.3. Comments on the Current Content of Web Service Education	836
4. Grid Services in the Context of SOA Education	836
5. Conclusions	838
References	838

88. Refactoring of Learning Objects for Mobile Learning

Robertas Damaševičius

1. Introduction	839
2. Technological and Educational Issues in m-Learning	840
2.1. Technological Constraints of Mobiles	840
2.2. Educational Issues in Using Mobile Devices	841
3. Refactoring of Learning Objects	841
3.1. Concept of Refactoring in Software Engineering	841
3.2. Learning Content Refactoring Techniques.	842
3.3. Framework of LO Refactoring	842
4. Case Study	844
4.1. Original Learning Object.	844
4.2. Refactoring of a LO to a Mobile Device.	844
5. Open Research Issues in LO Refactoring	845
6. Conclusion and Future Work	846
References	846

89. Early Orientation Toward Future Profession: A Case Study of Introduction into Information Systems Development for the First-Year Students*Alla Anohina, Janis Grundspenkis and Evita Nikitenko*

1. Introduction	849
2. Context	850
3. Previous Experience	851
4. Conception	852
5. Implementation of the Conception	854
6. Evaluation Results	856
7. Conclusions	858
References	858

90. Embedding Knowledge Management into Business Logic of E-learning Platform for Obtaining Adaptivity*Dumitru Dan Burdescu, Marian Cristian Mihaescu and Bogdan Logofatu*

1. Introduction	859
2. Methods and Materials	860
2.1. Tesys e-Learning Platform	860
2.2. Concept Maps	861
2.3. Data Filtering	861
2.4. Obtaining Recommendations	862
3. Analysis Process and Experiments	862
4. Conclusions and Future Works	864
References	864

91. Problem-Based Learning in a Programming Context—Planning and Executing a Pilot Survey on Database Access in a Programming Language*Peter Bellström and Nina Kilbrink*

1. Introduction	867
2. The PBL Pilot Survey	868
2.1. History and Related Work	868
2.2. Planning the PBL Pilot Survey	869
2.3. Executing the PBL Pilot Survey	871
2.4. Follow-Up and Evaluation of the PBL Pilot Survey	871
3. Perspectives on the PBL Pilot Survey	872
3.1. The Tutor Perspective	872
3.2. The Student Perspective	873
3.3. Collected Data	873
4. Analyses and Discussion	873
5. Summary and Conclusion	874
References	874

92. “Learning to Research” in a Virtual Learning Environment: A Case Study on the Effectiveness of a Socio-constructivist Learning Design*López-Alonso, C., Fernández-Pampillón, A., de-Miguel, E. and Pita, G.*

1. Introduction	877
1.1. The Research Question	878

2. The Socio-constructivist Learning Model	878
3. Design and Implementation of the VLE	879
4. Experiments: Methodology and Results	881
4.1. Methodology and Procedure	881
4.2. Analysis of Results	882
5. Discussion and Conclusions	882
References	883

93. IS Degrees – Sociotechnical or Technosocial?

Jenny Coady and Rob Pooley

1. Introduction	885
2. Some Key Existing Proposals	886
3. What Is Different in Our Approach	887
4. A “Technosocial” IS Curriculum	888
5. Conclusions and Further Work	889
References	890

94. Teaching Medium-Sized ERP Systems – A Problem-Based Learning Approach

Axel Winkelmann and Martin Matzner

1. Introduction	891
2. Procedure Model and Description of the Course	892
2.1. [Step 1] Selection of Evaluation Area and Framework	893
2.2. [Step 2] Market Overview	894
2.3. [Step 3a] Identification of Appropriate ERP Manufacturers	894
2.4. [Step 3b] Preparation of Scenario, Evaluation Objectives, and Literature	894
2.5. [Step 4] ERP Evaluations	895
2.6. [Step 5] ERP Presentations	895
3. System Evaluations and Presentations	896
3.1. General Comparison	896
3.2. Functional Comparison	896
3.3. Technical Comparison	897
4. Course Evaluation	899
4.1. Students’ Perspective	899
4.2. Manufacturers’ Perspective	900
4.3. Lecturer’s Perspective	900
References	900

95. Statistical Analysis for Supporting Inter-Institutional Knowledge Flows in the Context of Educational System

Renate Strazdina, Julija Stecjuka, Ilze Andersone and Marite Kirikova

1. Introduction	903
2. Inter-Institutional Model for Education System in Latvia	904
3. Data Type for supporting Statistical Analysis	905
4. Data-Gathering Procedure	907
5. Statistical Methods Overview for Supporting Inter-Institutional Knowledge Flows	907
6. Statistical Data Application	909

6.1. Forecast Data About First-Year Students' Knowledge Level and Scope in IT Field	909
6.2. The Forecast and Real Data to Support Knowledge Flows.....	911
7. Conclusions and Future Work.....	911
References	912

96. Using Agile Methods? – Expected Effects

Stefan Cronholm

1. Introduction	913
2. Research Approach	914
3. Findings	915
3.1. Expected Effects of Traditional Methods.....	915
3.2. Expected Effects of Agile Methods.....	916
3.3. Comparison of Effects.....	917
3.3.1. Added Effects	917
3.3.2. Lost Effects.....	918
3.3.3. Preserved Effects.....	918
4. Conclusions	918
References	919

97. Finding Categories and Keywords in Web Services

Christian Kop, Doris Gälle and Heinrich C. Mayr

1. Introduction	923
2. Related Work	924
3. Existing Web Service Languages	925
4. Ordinary Documents Versus Web Service Specifications	925
4.1. Structure	925
4.2. Domain	926
4.3. Users	926
5. Categories and Keywords Derived from Web Services	926
5.1. Useful Tag Information Derived from OWL-S Documents.....	927
5.2. Information Derived from WSDL Specifications.....	929
6. Categories, Keywords, and Types of Users	929
7. Conclusion and Future Work	930
References	931

98. MEDNET: Telemedicine via Satellite Combining Improved Access to Health-Care Services with Enhanced Social Cohesion in Rural Peru

Dimitrios Panopoulos, Ilias Sachpazidis, Despoina Rizou, Wayne Menary, Jose Cardenas and John Psarras

1. Introduction: Clinical and Technical Requirements	933
1.1. Medical Situation	934
1.2. Doctors Needs.....	934
1.3. Health-Care Infrastructure Needs.....	935
2. Architecture and Major Components of the System	935
2.1. TeleConsult	935
2.2. Medical Database/Health-Care Records	936
2.3. Satellite Communication/AmerHis	937
3. Community Engagement	938

4. Expected Impacts	938
5. Conclusions – Future Work	939
References	940
99. Why Can't We Bet on ISD Outcomes: ISD "Form" as a Predictor of Success	
<i>Mike Newman, Shan L. Pan and Gary Pan</i>	
1. Introduction	941
1.1. Football as an Allegory for ISD	942
1.2. Historical Context – "Form" or Antecedent Conditions	943
2. Case 1: Telecoms Corp.	944
3. Case 2: US Insurance Corporation	945
4. Lessons and Practical Implications	945
References	947
 Index	949

Conference Organisation

The 17th International Conference on Information Systems Development was hosted by the Department of Computer Science of the University of Cyprus at the Annabelle Hotel, Paphos, 25–27 August from 2008. The organization and management of such a major international conference requires the collaboration and dedication of very many people. We are especially grateful to our international programme committee who voluntarily gave their time to review the submissions. The excellent standard of papers contained within this volume bears testimony to the diligence and rigour of the peer review process. We are also very appreciative of the efforts of all the conference officers and the tremendous support provided by the local organizing committee.

Programme Chair

George A. Papadopoulos, University of Cyprus, Nicosia, Cyprus

Organising Chair

George A. Papadopoulos, University of Cyprus, Nicosia, Cyprus

International Advisory Committee

Gregory Wojtkowski	Boise State University	USA
Wita Wojtkowski	Boise State University	USA
Stanislaw Wrycza	University of Gdansk	Poland
Joze Zupancic	University of Maribor	Slovenia

Local Organising Committee

Pyrros Bratskas	University of Cyprus	Cyprus
Pericles Cheng	University of Cyprus	Cyprus
Constantinos Kakousis	University of Cyprus	Cyprus
Nearchos Paspallis	University of Cyprus	Cyprus

Track Chairs

Information Systems Engineering & Management

Andreas Andreou University of Cyprus Cyprus

Business Systems Analysis & Design

Michael Lang National University of Ireland, Galway Ireland

Intelligent Information Systems

Spyridon Likothanassis	University of Patras	Greece
Efstratios Georgopoulos	Technological Educational Institute of Kalamata	Greece
Adam Adamopoulos	Demokritus University of Thrace	Greece

Agile and High-Speed Systems Development Methods

Outi Salo VTT Technical Research Centre of Finland Finland
Geir Hanssen SINTEF Norway

Enterprise Systems Development & Adoption

Angelika I. Kokkinaki University of Nicosia (formerly Intercollege) Cyprus

Public Information Systems Development

George A. Papadopoulos	University of Cyprus	Cyprus
Yannis Charalabidis	National Technical University of Athens	Greece
Costas Kalaboukas	Singular-Logic	Greece

Information Systems Development Education

Aimilia Tzanavari University of Cyprus Cyprus

Information Systems Development in Developing Nations

John Traxler University of Wolverhampton UK

Legal and Administrative Aspects of Information Systems Development

Róinán Kennedy National University of Ireland, Galway Ireland

Information Systems Research Methodologies

Małgorzata Pankowska University of Economics in Katowice Poland

Service-Oriented Analysis and Design of Information Systems

Remigijus Gustas	Karlstad University	Sweden
William Song	University of Durham	UK
Stefanos Mavromoustakos	European University	Cyprus

IT Service Management

Vjeran Strahonja University of Zagreb Croatia

Philosophical and Theoretical Issues in Information Systems Development

Björn Niehaves	University of Münster	Germany
Karlheinz Kautz	Copenhagen Business School	Denmark

Model-driven Engineering in ISD

Maria Jose Escalona University of Sevilla Spain

Human Computer Interaction (HCI) in Information Systems Development

Andrina Granic University of Split Croatia

International Programme Committee

Witold Abramowicz	Economic University	USA
Par Agerfalk	University of Limerick	Sweden
Aiste Aleksandrviciene	Kaunas University of Technology	Lithuania
Patricia Alexander	Department of Informatics	South Africa
Alla Anohina	Riga Technical University	Latvia
Dace Apshvalka	Riga Technical University	Latvia
David Avison	ESSEC Business School	France
Per Backlund	University of Skovde	Sweden
Akhilesh Bajaj	The University of Tulsa	USA
Michal Barla	Slovak University of Technologies	Slovakia
Balbir Barn	Thames Valley Univesity	UK
Chris Barry	National University of Ireland	Galway
Rabih Bashroush	Queen's University of Belfast	UK
Richard Baskerville	Georgia State University	USA
Dragana Becejski-Vujaklija	Faculty of Organizational Sciences	Serbia
Peter Bellström	Karlstad University	Sweden
Paul Beynon-Davies	Cardiff Business School	UK

El Hassan Bezzazi	University de Lille 2	France
Juris Borzovs	Information Technology Institute	Latvia
Alena Buchalcevová	University of Economics	Czech Rep
Dumitru Burdescu	University of Craiova	Romania
Frada Burstein	Monash University	Australia
Dave Bustard	University of Ulster	UK
Rimantas Butleris	Kaunas University of Technology	Lithuania
Albertas Caplinskas	Institute of Mathematics and Informatics	Lithuania
Sven Carlsson	Lund University	Sweden
Michael Cavanagh	Balmoral Consulting	UK
Dubravka Cecez-Kecmanovic	University of New South Wales	Australia
Antanas Cenys	Semiconductor Physics Institute	Lithuania
Jenny Coady	Heriot-Watt University	UK
Gerry Coleman	Dundalk Institute of Technology	Ireland
Andy Connor	Auckland University of Technology	New Zealand
Alfredo Cuzzocrea	University of Calabria	Italy
Darren Dalcher	Middlesex University	UK
Gert-Jan de Vreede	University of Nebraska at Omaha	USA
Jack Downey	LERO	Ireland
Xiaofeng Du	Durham University	UK
Jim Duggan	University of Alabama	USA
Sean Duignan	Galway-Mayo Institute of Technology	Ireland
Dale Dzemydiene	Law University	Lithuania
Erki Eessaar	Tallinn University of Technology	Estonia
Owen Eriksson	Dalarna University College	Sweden
Chris Exton	University of Limerick	Ireland
George Feuerlicht	University of Technology	Australia
Gavin Finnie	Bond University	Australia
Marko Forsell	SESCA Technologies	Finland
Odd Fredriksson	Karlstad University	Sweden
Andreas Gadatsch	FH Bonn-Rhein-Sieg	Germany
Prima Gustiene	Karlstad University	Sweden
Javier Jesús Gutiérrez Rodríguez	University of Sevilla	Spain
Samer Hanna	Durham University	UK
G Harindranath	University of London	UK
Igor Hawryszkiewycz	University of Technology Sydney	Australia
Jonas Hedman	Copenhagen Business School	Sweden
Kevin Heffernan	Galway-Mayo Institute of Technology	Ireland
Markus Helfert	Dublin City University	Ireland
Ola Henfriddson	Viktoria Institute	Sweden
Alan Hevner	University of South Florida	USA
Val Hobbs	Murdoch University	Australia
Mairéad Hogan	National University of Ireland	Galway
Jesper Holck	Copenhagen Business School	Denmark
Helena Holmstrom	University of Limerick	Ireland

Magda Huisman	North-West University	South Africa
Sergey Ivanov	George Washington University	USA
Mirjana Ivanovic	University of Novi Sad	Serbia
Letizia Jaccheri	Norwegian University of Science and Technology	Norway
Christian Janiesch	SAP Australia Pty Ltd	Australia
Arek Januszewski	University of Technology and Agriculture	Poland
Björn Johansson	Copenhagen Business School	Danmark
Pasi Juvonen	South Carelia Polytechnic	Finland
Roland Kaschek	Massey University	New Zealand
Marite Kirikova	Riga Technical University	Latvia
Gabor Knapp	Budapest Univ of Technology & Economics	Hungary
Christian Kop	Alpen-Adria Universitaet Klagenfurt	Austria
John Krogstie	Norwegian University of Science and Technology	Norway
Gert Kruithof	TNO Information and Communication Techno	Netherlands
Marian Kuras	Cracow Academy of Economics	Poland
Rein Kuusik	Economic University	Estonia
Sergei Kuznetsov	Institute for System Programming of Russia	Russia
Vitus Lam	The University of Hong Kong	Hong Kong
John Lannon	University of Limerick	Ireland
Przemyslaw Lech	University of Gdansk	Poland
Mauri Leppänen	University of Jyvaskyla	Finland
Mikael Lind	University of Boras	Sweden
Henry Linger	Monash University	Australia
Graham Low	University of New South Wales	Australia
Audrone Lupekiene	Institute of Mathematics and Informatics	Lithuania
Kalle Lytytinen	Case Western Reserve University	USA
Dear Leszek A. Maciaszek	Macquarie University	Australia
Brenda Mallinson	Rhodes University	South Africa
Yannis Manolopoulos	Aristotle University Greece	Greece
Dorina Marghescu	Turku Centre for Computer Science/ Åbo A	Finland
Lars Mathiassen	Georgia State University	USA
John McAvoy	University College Cork	Ireland
Orla McHugh	National University of Ireland	Galway
Anna Medve	University of Pannonia Veszprem	Hungary
Regis Meissonier	Management School Montpellier	France
Ulf Melin	Linkoping University	Sweden
Elisabeth Metais	CNAM University	France
Peter Middleton	Queen's University of Belfast	UK
Owen Molloy	National University of Ireland	Galway
Robert Moreton	University of Wolverhampton	UK
Haris Mouratidis	University of East London	UK
Malcolm Munro	Durham University	UK
Anatoli Nachev	National University of Ireland	Galway
Pavol Navrat	Slovak University of Technology	Slovakia
Géza Németh	Budapest University of Technology and Economics	Hungary

Lina Nemuraite	Kaunas Technical University	Lithuania
Edephone Nfuka	Stockholm University	Sweden
Peter Axel Nielsen	Aalborg University	Denmark
Anders G. Nilsson	Karlstads University	Sweden
Ovidiu Noran	Griffith University	Australia
Jacob Norbjerg	Copenhagen Business School	Denmark
Gerard o'Donovan	Cork Institute of Technology	Ireland
Päivi Ovaska	South Carelia Polytechnic	Finland
Jill Owen	University College Canberra	Australia
Caroline Pade	Rhodes University	South Africa
Oscar Pastor	University of Valencia	Spain
Natalja Pavlova	Riga Technical University	Latvia
Anne Persson	University of Skoevde	Sweden
John Soren Pettersson	Karlstad University	Sweden
George Philip	The Queen's University of Belfast	UK
Maritta Pirhonen	University of Jyvaskyla	Finland
Alain Pirotte	University of Louvain	Belgium
Dijana Plantak Vukovac	University of Zagreb	Croatia
Tomasz Plata-Przechlewski	Gdansk University	Poland
Jaroslav Pokorny	Charles University	Czech Rep.
Norah Power	University of Limerick	Ireland
Adam Przybylek	Gdansk University	Poland
Boris Rachev	Technical University of Varna	Bulgaria
Isidro Ramos Salavert	Universitat Politecnica de Valencia	Spain
Birger Rapp	Linkoping University	Sweden
Vaclav Repa	Prague University of Economics	Czech Rep
Karel Richta	Czech Technical University	Czech Rep
Peter Rittgen	University College of Boras	Sweden
Tarmo Robal	Tallinn University of Technology	Estonia
Kamel Rouibah	Kuwait University	Kuwait
Alice Rupe	AR IT Solutions	USA
Adriana Schiopiu Burlea	University of Craiova	Romania
Dirk Schreiber	FH Bonn-Rhein-Sieg	Germany
Maha Shaikh	London School of Economics	UK
Peretz Shoval	Ben-Gurion University	Israel
Keng Siau	University of Nebraska – Lincoln	USA
Klaas Sikkel	University of Twente	Netherlands
Rok Skrinjar	University of Ljubljana	Slovenia
Piotr Soja	Cracow University of Economics	Poland
Tor Stalhane	Norwegian University of Science and Technology	Norway
Ioannis Stamelos	Aristotle University	Greece
Larry Stapleton	Waterford Institute of Technology	Ireland
Odd Steen	Lund University	Sweden
Darijus Strasunskas	NTNU	Norway
Uldis Sukovskis	Riga Technical University	Latvia

Bo Sundgren	Mid Sweden University	Sweden
Janis Tenteris	Riga Technical University	Latvia
Domonkos Tikk	Budapest University of Technology and Economics	Hungary
Anna Trifonova	Norwegian University of Science and Technology	Norway
Tuure Tuunanen	The University of Auckland	New Zealand
Tero Vartiainen	Turku School of Economics	Finland
Olegas Vasilecas	Vilnius Gediminas Technical University	Lithuania
Damjan Vavpotic	University of Ljubljana	Slovenia
Anna Vindere	Latvia University of Agriculture	Latvia
Jiri Vorisek	Prague University of Economics	Czech Rep
Gottfried Vossen	University of Munster	Germany
Taujanskas Vytautas	Kaunas University of Technology	Lithuania
Hongbing Wang	Southeast University	China
Leoni Warne	Defence Science and Technology Organisation	Australia
Dave Wastell	University of Salford	UK
Christine Welch	University of Portsmouth	UK
Wita Wojtkowski	Boise State University	USA
Carson C. Woo	University of British Columbia	Canada
Stanislaw Wrycza	University of Gdansk	Poland
Heitor Augustus Xavier Costa	Universidade Federal de Lavras	Brazil
Chia-Hui Yen	Wu-Feng Institute of Technology	Taiwan
Gian Piero Zarri	Universite Paris 4/Sorbonne	France
Jozef Zurada	University of Louisville	USA

Contributors

Linas Abloksis

Department of Information Systems
Kaunas University of Technology
Kaunas, Lithuania

P. Acampa

Istituto di Cibernetica “E. Caianiello”
Consiglio Nazionale delle Ricerche, Italy

Adam V. Adamopoulos

Pattern Recognition Laboratory
Department of Computer Engineering and Informatics
and
University of Patras Artificial Intelligence Research Center
(U.P.A.I.R.C.)
University of Patras
Patras, Greece
and
Medical Physics Laboratory
Department of Medicine
Democritus University of Thrace
Alexandroupolis, Greece

Pär J. Ågerfalk

Department of Information Science,
Uppsala University, Uppsala, Sweden
and
Lero – The Irish Software Engineering Research Centre
Limerick, Ireland

Pierre Akiki

Department of Computer Science
Notre Dame University
Zouk Mosbeh, Lebanon

Sabah Al-Fedaghi

Computer Engineering Department
Kuwait University
Kuwait

Christos Nikolaos Anagnostopoulos

Cultural Technology and Communication Department
University of the Aegean
Aegean, Greece

Ilze Andersone

Department of Systems Theory and Design
Riga Technical University
Riga, Latvia

Alla Anohina

Department of Systems Theory and Design
Riga Technical University
Riga, Latvia

Giannakis Antoniou

The University of Melbourne
Victoria, Australia

Nicolas Arni-Bloch

University of Geneva
Geneva, Switzerland

Aybuke Aurum

School of Information Systems, Technology and Management
The Australian School of Business
University of New South Wales
Sydney, Australia

Jan Helge Austbø

Department of Information Systems
University of Agder
Kristiansand, Norway

Marios N. Avraamides

Department of Psychology
University of Cyprus
Nicosia, Cyprus

Amelia Badica

Department of Business Information Systems
University of Craiova
Craiova, Romania

Costin Badica

Department of Software Engineering
University of Craiova
Craiova, Romania

Lina Bagusyte

Software Engineering Department
Institute of Mathematics and Informatics
Vilnius, Lithuania

Balbir S. Barn

Middlesex University
London, UK

Hamish T. Barney

School of Information Systems Technology and Management
The University of New South Wales
Sydney, Australia

R. Bashroush

ECIT
Queen's University of Belfast
Belfast, UK

Lynn Batten

Deakin University
Victoria, Australia

Jörg Becker

European Research Center for Information Systems
University of Münster
Münster, Germany

Peter M. Bednar

School of Computing
University of Portsmouth
Portsmouth, UK
and
Department of Informatics
Lund University
Lund, Sweden

Peter Bellström

Department of Information Systems
Karlstad University
Karlstad, Sweden

Yolande Berbers

University of Leuven
Leuven, Belgium

Solvita Bērziša

Faculty of Computer Science and Information Technology
Riga Technical University
Riga, Latvia

Kamaljit Kaur Bimrah

Innovative Informatics, School of Computing and Technology
University of East London
London, UK

Pyrros Bratskas

Department of Computer Science
University of Cyprus
Nicosia, Cyprus

Maricela Bravo

Informatique Department
Morelos State Polytechnic University
México

Ramunas Brazinskas

Department of Informatics
Klaipeda University
Klaipeda, Lithuania

Sjaak Brinkkemper

Institute of Information and Computer Sciences
University of Utrecht
Utrecht, The Netherlands

Dumitru Dan Burdescu

Department of Software Engineering
University of Craiova
Craiova, Romania

María Eugenia Cabello

Polytechnic University of Valencia
Valencia, Spain

Albertas Caplinskas

Software Engineering Department
Institute of Mathematics and Informatics
Vilnius, Lithuania

Jose Cardenas

Department of Informatics
DIRESA Junin
Peru

Yannis Charalabidis

Decision Support Systems Laboratory
National Technical University of Athens
Athens, Greece

Karel Charvat

Czech Centre for Science and Society
Praha, Czech Republic

Deren Chen

College of Computer Science
Zhejiang University
Zhejiang, China

Fang Chen

National Information and Communication Technology
Australia (NICTA) Australian
Technology Park
Sydney, Australia

Rares M. Chiriacescu

SIVECO Romania
Bucharest, Romania

Eric Choi

National Information and Communication Technology
Australia (NICTA) Australian
Technology Park
Sydney, Australia

Emma Chávez

School of Information Technology
Bond University
Australia
and
Departamento de Ing. Informática
Universidad Católica de la Ssma Concepción
Chile

Jenny Coady

Department of Computer Science
Heriot Watt University
Edinburgh, Scotland

Martha Coronel

Informatique Department
Morelos State Polytechnic University
México

Gabriel J. Costello

Galway-Mayo Institute of Technology
Galway, Ireland
and
Centre for Innovation and Structural Change
National University of Ireland
Galway, Ireland

Fanny Coudert

Interdisciplinary Centre for Law and ICT
K.U. Leuven
Leuven, Belgium

Chris Coughlan

Hewlett-Packard Galway Limited
Ireland

Stefan Cronholm

Department of Management and Engineering
Linköping University
Linköping, Sweden

Stephen Cummins

Department of Computer Science
Durham University
Durham, UK

Salem Ben Dhaou Dakhli

CERIA Laboratory
Paris-Dauphine University
France

Robertas Damasevičius

Software Engineering Department
Kaunas University of Technology
Kaunas, Lithuania

Aniruddha Dasgupta

Decision System Laboratory
School of Computer Science and Software Engineering
University of Wollongong
Wollongong, NSW, Australia

E. de-Miguel

Lingüística General
Facultad de Filología
Universidad Complutense de Madrid
Madrid, Spain

Michel Deriaz

Advanced Systems Group
Centre Universitaire d'Informatique
University of Geneva
Geneva, Switzerland

Yun Ding

European Media Laboratory GmbH
Heidelberg, Germany

Brian Donnellan

National University of Ireland
Galway, Ireland

Xiaofeng Du

Computer Science Department
University of Durham
Durham, North Carolina
USA

M.J. Escalona

University of Seville
Seville, Spain

A. Fernández-Pampillón

Lingüística General
Facultad de Filología
Universidad Complutense de Madrid
Madrid, Spain

George Feuerlicht

University of Technology
Sydney
Australia
and
University of Economics
Prague, Czech Republic

Gavin Finnie

School of Information Technology
Bond University
Australia

Monica Florea

SIVECO Romania
Bucharest, Romania

Andreas Gadatsch

Bonn-Rhein Sieg University of Applied Science
Sankt Augustin, Germany

Joe Geldart

Department of Computer Science
Durham University
Durham, UK

Efstratios F. Georgopoulos

Pattern Recognition Laboratory
Department of Computer Engineering and Informatics
and
University of Patras Artificial Intelligence
Research Center (U.P.A.I.R.C.),
University of Patras
Patras, Greece
and
Technological Educational Institute of Kalamata
Kalamata, Greece

Aditya K. Ghose

Decision System Laboratory
School of Computer Science and
Software Engineering
University of Wollongong
Wollongong, NSW
Australia

Jānis Grabis

Faculty of Computer Science and
Information Technology
Riga Technical University
Riga, Latvia

Andrina Granić

Faculty of Science
University of Split
Split, Croatia

Janis Grundspenkis

Department of Systems Theory and Design
Riga Technical University
Riga, Latvia

Endre Grøtnes

Department of Informatics
University of Oslo
Oslo, Norway

Remigijus Gustas

Department of Information Systems
Karlstad University
Karlstad, Sweden

Prima Gustiene

Department of Information Systems
Karlstad University
Karlstad, Sweden

J.J. Gutiérrez

University of Seville
Seville, Spain

Regina Gyampoh-Vidogah

Care Services Improvement Partnership
Department of Health
London, UK

Doris Gälle

Institute of Applied Informatics
Alpen-Adria-Universität Klagenfurt
Austria

Karen Hamber

School of Information Systems, Technology and Management
University of New South Wales
Sydney, Australia

Matthias Hansen

Department of Informatics
Technische Universität München
München, Germany

Karin Hedström

MELAB
Swedish Business School
Örebro University
Örebro, Sweden

Petr Horak

Wirelessinfo
Litovel, Czech Republic

Xiaoming Hu

European Media Laboratory GmbH
Heidelberg, Germany

Mats-Åke Hugoson

Department of Informatics
Jönköping International Business School
Jönköping, Sweden

G.B. Huitema

TNO Information and Communication Technology
Groningen, The Netherlands

Andreas A. Ioannides

Laboratory for Human Brain Dynamics
Brain Science Institute
Saitama, Japan

V. Iordan

Computer Science Department
West University of Timisoara
Timisoara, Romania

Björn Johansson

Copenhagen Business School
Center for Applied Information and Communication
Technology
Frederiksberg, Denmark

Bojan Jovičić

Delta Sport
Belgrade, Serbia

Darius Jurkevicius

Department of Information Systems
Faculty of Fundamental Sciences
Vilnius Gediminas Technical University
Vilnius, Lithuania

Pasi Juvonen

South Karelia University of Applied Sciences
Imatra, Finland

Judith Kabeli-Shani

Department of Industrial and Management Engineering
Shenkar College of Engineering and Design
Ramat-Gan, Israel

Konstantinos Kakousis

Department of Computer Science
University of Cyprus
Nicosia, Cyprus

Ahto Kalja

Department of Computer Engineering
Tallinn University of Technology
Estonia

Fredrik Karlsson

MELAB
Swedish Business School
Örebro University
Örebro, Sweden

Nina Kilbrink

Department of Information Systems
Karlstad University
Karlstad, Sweden

Peter Killisperger

Competence Center Information Systems
University of Applied Sciences – München
Germany
and

Advanced Computing Research Centre
University of South Australia
Adelaide, Australia

Marite Kirikova

Department of Systems Theory and Design
Riga Technical University
Riga, Latvia

Christian Kop

Research Group Application Engineering
Institute for Applied Informatics
Alpen-Adria-Universität Klagenfurt
Austria

V. Koufi

Department of Digital Systems
University of Piraeus
Piraeus, Greece

Helmut Krcmar

Department of Informatics
Technische Universität München
München, Germany

Aneesh Krishna

Decision System Laboratory
School of Computer Science and Software Engineering
University of Wollongong
Wollongong, NSW, Australia

Padmanabhan Krishnan

School of Information Technology
Bond University
Australia

Steinar Kristoffersen

Faculty of Computer Science
Østfold University College
Halden, Norway

G.H. Kruithof

TNO Information and Communication Technology
Groningen, The Netherlands

Fenareti Lampathaki

Decision Support Systems Laboratory
National Technical University of Athens
Athens, Greece

Michael Lang

Business Information Systems Group
Cairnes School of Business and Economics
National University of Ireland
Galway, Ireland

Mauri Leppänen

University of Jyväskylä
Computer Science and Information Systems
Jyväskylä, Finland

Spiridon D. Likothanassis

Pattern Recognition Laboratory
Department of Computer
Engineering and Informatics
and
University of Patras Artificial Intelligence Research Center
(U.P.A.I.R.C.)
University of Patras
Patras, Greece

Henry Linger

Faculty of Information Technology
Monash University
Melbourne, Australia

A. Llergo

Servicio Andaluz de Salud
Seville, Spain

Bogdan Logofatu

CREDIS Department
University of Bucharest
Bucharest, Romania

Graham C. Low

Information Systems, Technology and Management
The Australian School of Business
University of New South Wales
Sydney, Australia

Shumin Lu

The Key Lab of Electronic-Commerce
Xi'an Jiaotong University
China

Audrone Lupeikiene

Software Engineering Department
Institute of Mathematics and Informatics
Vilnius, Lithuania

H. Luthria

Information Systems, Technology and Management
The Australian School of Business
University of New South Wales
Sydney, Australia

C. López-Alonso

Lingüística General
Facultad de Filología
Universidad Complutense de Madrid
Madrid, Spain

Hoda Maalouf

Department of Computer Science
Notre Dame University
Zouk Mosbeh
Lebanon

F. Malamatienou

Department of Digital Systems
University of Piraeus
Piraeus, Greece

M. Mango Furnari

Istituto di Cibernetica "E. Caianiello"
Consiglio Nazionale delle Ricerche
Italy

F. Martín

Servicio Andaluz de Salud
Seville, Spain

Nikola Marangunić

Faculty of Science
University of Split
Split, Croatia

Martin Matzner

European Research Center
for Information Systems
University of Muenster
Münster, Germany

Heinrich C. Mayr

Institute of Applied Informatics
Alpen-Adria-Universität Klagenfurt, Austria

Wayne Menary

GeoPac
Coventry, UK

Marian Cristian Mihaescu

Department of Software Engineering
University of Craiova
Craiova, Romania

Ivica Mitrović

Arts Academy
University of Split
Split, Croatia

Irena Mlynkova

Department of Software Engineering
Charles University
Prague, Czech Republic

F. Morero

Sun Microsystems
Madrid, Spain

Robert Moreton

School of Computing and IT
University of Wolverhampton
Wolverhampton, UK

Haralambos Mouratidis

Innovative Informatics, School
of Computing and Technology
University of East London
London, UK

Malcolm Munro

Computer Science Department
University of Durham
Durham, North Carolina
USA

Oliver Müller

European Research Center for Information Systems
University of Münster
Münster, Germany

Costas K. Neocleous

Department of Mechanical Engineering
Cyprus University of Technology
Lemesos, Cyprus

Kleanthis C. Neokleous

Department of Computer Science
University of Cyprus
Nicosia, Cyprus

Mike Newman

Manchester Business School
The University of Manchester
Manchester, UK
and
Copenhagen Business School
Copenhagen, Denmark

J. Nieto

Servicio Andaluz de Salud
Seville, Spain

Oksana Nikiforova

Department of Applied Computer Science
Riga Technical University
Riga, Latvia

Evita Nikitenko

Department of Systems Theory and Design
Riga Technical University
Riga, Latvia

Anders G. Nilsson

Department of Information Systems
Karlstad University
Karlstad, Sweden

Ovidiu Noran

School of ICT
Griffith University Australia
Australia

Md Noor Nor Laila

Department of System Science
Universiti Teknologi MARA
Malaysia

C. Noviello

Istituto di Cibernetica “E. Caianiello”
Consiglio Nazionale delle Ricerche
Italy

Samia Oussena

Thames Valley University
London, UK

Päivi Ovaska

South Karelia University of Applied Sciences
Imatra, Finland

Jill Owen

School of Business, Australian
Defence Force Academy
University of New South Wales
Sydney, Australia

Tero Päivärinta

Department of Information Systems
University of Agder
Kristiansand, Norway

Gary Pan

Singapore Management University
Singapore

Shan L. Pan

Department of Information Systems
National University of Singapore
Singapore

Małgorzata Pankowska

University of Economics
Katowice, Poland

Contributors

Dimitrios Panopoulos

Decision Support Systems Laboratory
National Technical University of Athens
Athens, Greece

George A. Papadopoulos

Department of Computer Science
University of Cyprus
Nicosia, Cyprus

D. Papakonstantinou

Department of Digital Systems
University of Piraeus
Piraeus, Greece

Udaya Parampalli

The University of Melbourne
Victoria, Australia

C.L. Parra

Servicio Andaluz de Salud
Seville, Spain

Lina Paškevičiūtė

Software Engineering Department
Institute of Mathematics and Informatics
Vilnius, Lithuania

Nearchos Paspallis

Department of Computer Science
University of Cyprus
Nicosia, Cyprus

Natalya Pavlova

Department of Applied Computer Science
Riga Technical University
Riga, Latvia

F. Pérez

Servicio Andaluz de Salud
Seville, Spain

D. Petcu

Institute e-Austria Timisoara
Timisoara, Romania
and
Computer Science Department
West University of Timisoara
Timisoara, Romania

Georg Peters

Department of Computer
Science and Mathematics
University of Applied Sciences – München
München, Germany

Manuele Kirsch Pinheiro

University of Leuven
Leuven, Belgium

G. Pita

Lingüística General
Facultad de Filología
Universidad Complutense de Madrid
Madrid, Spain

Dijana Plantak Vukovac

Department of Information Systems Development
Faculty of Organization and Informatics
University of Zagreb
Varazdin, Croatia

Jaroslav Pokorný

Charles University of Prague
Prague, Czech Republic

Rob Pooley

Department of Computer Science
Heriot Watt University
Edinburgh, Scotland

Sorin Portase

SIVECO Romania
Bucharest, Romania

David Preston

Innovative Informatics, School
of Computing and Technology
University of East London
London, UK

Tomasz Przechlewski

Katedra Informatyki Ekonomicznej
Uniwersytet Gdańskie
Piaskowa, Poland

John Psarras

Decision Support Systems Laboratory
National Technical University of Athens
Athens, Greece

F.A. Rabhi

Information Systems,
Technology and Management
The Australian School of Business
University of New South Wales
Sydney, Australia

Lemonia Ragia

Advanced Systems Group
Centre Universitaire d'Informatique
University of Geneva
Geneva, Switzerland

Jolita Ralyté

University of Geneva
Geneva, Switzerland

Isidro Ramos

Polytechnic University of Valencia
Valencia, Spain

Yuan Rao

College of Software Engineer
Xi'an Jiaotong University
China

Karel Richta

Charles University of Prague
Prague, Czech Republic

Despoina Rizou

Department Cognitive Computing
and Medical Imaging
Fraunhofer IGD
Darmstadt, Germany

Tarmo Robal

Department of Computer Engineering
Tallinn University of Technology
Estonia

Sérgio A. Rodrigues

COPPE/UFRJ – Computer Science Department
Graduate School of Engineering
Federal University of Rio de Janeiro
Brazil

Picek Ruben

Department of Information System Development
Faculty of Organization and Informatics
University of Zagreb
Varaždin, Croatia

F.J. Rumph

TNO Information and Communication Technology
Groningen, The Netherlands

Narongdech Ruttananontsatean

Kanchanaburi Rajabhat University
Thailand

Øystein Sæbø

Department of Information Systems
University of Agder
Kristiansand, Norway

Ilias Sachpazidis

Department Cognitive Computing
and Medical Imaging
Fraunhofer IGD
Darmstadt, Germany

Tomas Salamon

Department of Information Technologies
University of Economics
Prague, Czech Republic

David Sallah

University of Wolverhampton
Wolverhampton, UK

Demetrios Sarantis

Decision Support Systems Laboratory
National Technical University of Athens
Athens, Greece

Svein Sundfør Scheie

The Norwegian Post and Telecommunications
Authority
Norway

Christos N. Schizas

Department of Computer Science
University of Cyprus
Nicosia, Cyprus

Ulf Seigerroth

Department of Informatics
Jönköping International Business School
Jönköping, Sweden

Jean-Marc Seigneur

Advanced Systems Group
Centre Universitaire d'Informatique
University of Geneva
Geneva, Switzerland

Mehad Shafie

Department of System Science
Universiti Teknologi MARA
Malaysia

Yu Shi

National Information and Communication Technology Australia
(NICTA) Australian
Technology Park
Sydney, Australia

Peretz Shoval

Department of Information Systems Engineering
Ben-Gurion University
Beer-Sheva, Israel

Aidas Smaizys

Department of Informatics
Klaipeda University
Klaipeda, Lithuania

Darja Solodovnikova

University of Latvia
Riga, Latvia

William Song

Computer Science Department
University of Durham
Durham, North Carolina
USA

Jano M. Souza

COPPE/UFRJ – Computer Science Department
Graduate School of Engineering
Federal University of Rio de Janeiro
Brazil
and
DCC-IM/UFRJ – Computer Science Department
Mathematics Institute
Federal University of Rio de Janeiro
Brazil

I. Spence

ECIT
Queen's University of Belfast
Belfast, UK

Julija Stecjuka

Department of Systems Theory and Design
Riga Technical University
Riga, Latvia

Greg Stephens

School of Information Systems, Technology and Management
University of New South Wales
Sydney, Australia

Renate Strazdina

Department of Systems Theory and Design
 Riga Technical University
 Riga, Latvia

Krystyna Strzała

Katedra Ekonometrii
 Uniwersytet Gdańskiego
 Poland

Markus Stumptner

Advanced Computing Research Centre, University of South Australia
 Adelaide, Australia

Thomas Stückl

Siemens Corporate Technology, Software and System Processes
 Munich, Germany

Ali Sunyaev

Department of Informatics
 Technische Universität München
 München, Germany

Alexandru Szőke

SIVECO Romania
 Bucharest, Romania

Ronnie Taib

National Information and Communication Technology Australia (NICTA) Australian Technology Park
 Sydney, Australia

Christos Tsiakalidis

Planet
 Athens, Greece

Katriina Valtonen

University of Jyväskylä
 Computer Science and Information Systems
 Jyväskylä, Finland

Yves Vanrompay

University of Leuven
 Leuven, Belgium

Marlies van Steenbergen

Architecture and Business Solutions
 Sogeti Netherlands B.V
 The Netherlands

Tero Vartiainen

Pori Unit
 Turku School of Economics
 Turku, Finland

Olegas Vasilecas

Department of Informatics
 Klaipeda University
 Klaipeda, Lithuania
 and
 Department of Information Systems
 Faculty of Fundamental Sciences
 Vilnius Gediminas Technical University
 Vilnius, Lithuania

G. Vassilacopoulos

Department of Digital Systems
 University of Piraeus
 Piraeus, Greece

Marco A. Vaz

COPPE/UFRJ – Computer Science Department
 Graduate School of Engineering
 Federal University of Rio de Janeiro
 Brazil

Strahinja Vjeran

Department of Information System Development
 Faculty of Organization and Informatics
 University of Zagreb
 Varaždin, Croatia

Siniša Vlajić

Faculty of Organizational Sciences
 University of Belgrade
 Belgrade, Serbia

Martin Vlk

Help Forest
 Sumperk, Czech Republic

Barbara Vogrinec

CPZ-International
 Centre for Knowledge Promotion
 Ljubljana, Slovenia

Eftichia Vovoli

Cultural Technology and Communication Department
 University of the Aegean
 Aegean, Greece

Jürgen Vöhringer

Research Group Application Engineering
 Institute for Applied Informatics
 University of Klagenfurt
 Austria

Wan Mohd Isa Wan Abdul Rahim

Department of System Science
 Universiti Teknologi MARA
 Malaysia

Christine Welch

Department of Strategy and Business Systems
 University of Portsmouth Business School
 Portsmouth, UK

Evi Werkers

Interdisciplinary Centre for Law and ICT
 K.U. Leuven
 Leuven, Belgium

Axel Winkelmann

European Research Center for Information Systems
 University of Muenster
 Münster, Germany

Kai Wistrand

MELAB
 Swedish Business School
 Örebro University
 Örebro, Sweden

ZhiXiong Yang

Zhongguancun Haidian High-Technique Park Postdoc
Workstation-UFIDA Substation
Beijing, China

Gian Piero Zarri

Virthualis
Politecnico di Milano
Milano, Italia