
**ADVANCES IN INFORMATION SYSTEMS
RESEARCH, EDUCATION AND PRACTICE**

IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

ADVANCES IN INFORMATION SYSTEMS RESEARCH, EDUCATION AND PRACTICE

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IFIP 2008 World Computer Congress (WCC'08)

Message from the Chairs

Every two years, the International Federation for Information Processing hosts a major event which showcases the scientific endeavours of its over one hundred Technical Committees and Working Groups. 2008 sees the 20th World Computer Congress (WCC 2008) take place for the first time in Italy, in Milan from 7-10 September 2008, at the MIC - Milano Convention Centre. The Congress is hosted by the Italian Computer Society, AICA, under the chairmanship of Giulio Occhini.

The Congress runs as a federation of co-located conferences offered by the different IFIP bodies, under the chairmanship of the scientific chair, Judith Bishop. For this Congress, we have a larger than usual number of thirteen conferences, ranging from Theoretical Computer Science, to Open Source Systems, to Entertainment Computing. Some of these are established conferences that run each year and some represent new, breaking areas of computing. Each conference had a call for papers, an International Programme Committee of experts and a thorough peer reviewed process. The Congress received 661 papers for the thirteen conferences, and selected 375 from those representing an acceptance rate of 56% (averaged over all conferences).

An innovative feature of WCC 2008 is the setting aside of two hours each day for cross-sessions relating to the integration of business and research, featuring the use of IT in Italian industry, sport, fashion and so on. This part is organized by Ivo De Lotto. The Congress will be opened by representatives from government bodies and Societies associated with IT in Italy.

This volume is one of fourteen volumes associated with the scientific conferences and the industry sessions. Each covers a specific topic and separately or together they form a valuable record of the state of computing research in the world in 2008. Each volume was prepared for publication in the Springer IFIP Series by the conference's volume editors. The overall Chair for all the volumes published for the Congress is John Impagliazzo.

For full details on the Congress, refer to the webpage <http://www.wcc2008.org>.

Judith Bishop, South Africa, Co-Chair, International Program Committee
Ivo De Lotto, Italy, Co-Chair, International Program Committee
Giulio Occhini, Italy, Chair, Organizing Committee
John Impagliazzo, United States, Publications Chair

WCC 2008 Scientific Conferences

TC12	AI	Artificial Intelligence 2008
TC10	BICC	Biologically Inspired Cooperative Computing
WG 5.4	CAI	Computer-Aided Innovation (Topical Session)
WG 10.2	DIPES	Distributed and Parallel Embedded Systems
TC14	ECS	Entertainment Computing Symposium
TC3	ED_L2L	Learning to Live in the Knowledge Society
WG 9.7	HCE3	History of Computing and Education 3
TC3		
TC13	HCI	Human Computer Interaction
TC8	ISREP	Information Systems Research, Education and Practice
WG 12.6	KMIA	Knowledge Management in Action
TC2	OSS	Open Source Systems
WG 2.13		
TC11	IFIP SEC	Information Security Conference
TC1	TCS	Theoretical Computer Science

IFIP

- is the leading multinational, apolitical organization in Information and Communications Technologies and Sciences
- is recognized by United Nations and other world bodies
- represents IT Societies from 56 countries or regions, covering all 5 continents with a total membership of over half a million
- links more than 3500 scientists from Academia and Industry, organized in more than 101 Working Groups reporting to 13 Technical Committees
- sponsors 100 conferences yearly providing unparalleled coverage from theoretical informatics to the relationship between informatics and society including hardware and software technologies, and networked information systems

Details of the IFIP Technical Committees and Working Groups can be found on the website at <http://www.ifip.org>.

Preface

Introduction

The International Federation for Information Processing (IFIP) is a non-profit umbrella organization for national societies working in the field of information processing. It was founded in 1960 under the auspices of UNESCO. It is organized into several technical committees. This book represents the proceedings of the 2008 conference of technical committee 8 (TC8), which covers the field of information systems. TC8 aims to promote and encourage the advancement of research and practice of concepts, methods, techniques and issues related to information systems in organisations. TC8 has established eight working groups covering the following areas: design and evaluation of information systems; the interaction of information systems and the organization; decision support systems; e-business information systems: multi-disciplinary research and practice; information systems in public administration; smart cards, technology, applications and methods; and enterprise information systems. Further details of the technical committee and its working groups can be found on our website (ifiptc8.dsi.uminho.pt).

This conference was part of IFIP's World Computer Congress in Milan, Italy which took place 7-10 September 2008. The occasion celebrated the 32nd anniversary of IFIP TC8. The call for papers invited researchers, educators, and practitioners to submit papers and panel proposals that advance concepts, methods, techniques, tools, issues, education, and practice of information systems in organizations. Thirty one submissions were received. All submissions were rigorously refereed by at least three reviewers and following the review and resubmission process, less than half of the submissions were accepted. The current proceedings reflect not only the breadth and depth of the work of TC8, but also the international nature of the group - the authors come from 10 countries and 5 continents.

The Information Systems discipline has often reflected about the issues addressed in this conference. This has been most noticeably undertaken by TC8's WG8.2 – for example, at its 2000 Working Conference on Organizational and Social Perspectives on Information Technology, and, more recently, in 2004 at its 20th year retrospective, Relevant Theory and Informed Practice. This is, however, is the first time that TC8 as a whole is addressing issues of research, education, and practice, and therefore, a milestone in its own right. It is the hope of the organizers that this conference responds to the call of Hirschheim and Klein in their 2000 paper on “Information Systems at the Crossroads: External versus Internal Views,” where they pointed out that “the current publication culture of narrowly focused, highly specialized papers is one of the major impediments to making our research more relevant to practitioners. We simply must attempt the difficult, but invaluable, syntheses that pull together research results from the various sub-communities into broader analyses of potential interest to practitioner communities.”

The 15 papers in this volume cover a broad spectrum, and in order to provide a structure for the presentation of the papers at the conference itself, we made an attempt to classify the papers, and we followed this classification in this volume. We realise that it is never straightforward to classify a set of papers. Any classification imposes a certain mental compartmentalisation of the material at hand, and (potentially) destroys the relationships between the component parts of the whole. We ask the reader to discover the integrated whole of the proceedings as an exercise in hermeneutical analysis! Our classification of the papers is as follows: Information systems education; New perspectives on information systems development; Defining, modelling and diffusing information systems projects; Knowledge management and business intelligence; and Applications and emerging technologies.

Before introducing the papers in the proceedings, we would like recognize our two very special keynote speakers. Both look at our conference theme with the overall umbrella of professionalism. Information systems is no longer ‘the new kid on the block,’ and we no longer have the luxury of “beginner’s errors.” We must attain

professional standards in our research, education, and practice commensurate with societies' dependence on the systems we build. Bill Olle exemplifies this professionalism and indeed he has every right to be seen as the 'organizational knowledge' of TC8 as he was an early pioneer in our field as well as being a consistent contributor to the group's work over the years. His keynote paper is entitled *reflections on 50 years of computing: impact of professionalism on teaching, practice and research* and these reflections form an ideal base on which to build our conference.

Our second keynote speaker turns our attention to the future with his vision of tomorrow's IS professional. As chair of the IFIP International professional practice partnership, Charles Hughes is leading an effort to build a global standard of IT knowledge, experience, competency, and integrity. His talk is entitled *The IFIP International professional practice partnership: Transforming and informing IT professional practice*.

Information Systems Education

Our first group of three papers have been categorized as IS education, though the papers can be seen also as covering the discipline of information systems as a whole as they discuss the links between teaching, research, and practice. The first paper by Jorma Riihijärvi and Juhani Iivari is entitled *the practical relevance of IT education: skill requirements and education expectations of practitioners*. This paper suggests two interpretations of the practical relevance of IT education at the university level: the congruence between skill requirements of IT experts and the skills provided by the education on the one hand and the practitioners' expectations concerning these skills on the other. A questionnaire study shows significant differences between what is provided compared to what is expected.

The second paper by Juhani Iivari, Rudy Hirschheim and Heinz K. Klein is entitled *challenges of professionalization: bridging research and practice through a body of knowledge for IT specialists*. This paper suggests that the interpretation and development of IT occupations as knowledge work might provide a more realistic avenue to

proceed towards more professional practice in the IT field than the ambition of trying to establish them as true professions. The idea of knowledge work leads the authors to focus on a distinct body of knowledge for IS professionals. The paper discusses how the gap between research and practice could be bridged by making IT research more sensitive to practice.

The final paper in this category is *mapping research questions to research methods* by Pertti Järvinen. In information systems there is a wide range of research methods available. Yet selection of a research method appropriate to the research question remains a problem. The author supplements the well-accepted IS research methods with some important amendments like mathematical approaches, theoretical studies and the dissensus and consensus views, and he presents instructions on how to select a suitable research approach given a research question.

New Perspectives on Information Systems Development

Our second category of papers, that of new perspectives on IS development has sometimes been seen as the core of the discipline and has been a main concern of two of TC 8's most well-established working groups, on the design and evaluation of information systems (WG 1), and the interaction of information systems and the organization (WG 2).

The paper of Jan Pries-Heje, Linda Levine, Richard Baskerville and Bala Ramesh entitled *advances in information systems development: from discipline and predictability to agility and improvisation* discusses how the process of IS development has changed over the years. When information systems development (ISD) was coined as a term and evolved into a research area we lived in a largely industrial economy. This traditional universe placed high value on discipline and predictability for its own sake. In the 1990s several new trends began to question and challenge the traditional view. Specifically, Internet marketplaces created a new environment for information systems development, and novel approaches such as

agile methods emerged. In their paper, these authors present an analysis of empirical findings showing how new principles and practices have come to exist in a parallel economic universe with increased emphasis on agility and improvisation.

The paper by Jens-Magnus Arndt, Thomas Kude and Jens Dibbern, *the emergence of partnership networks in the enterprise application development industry: a global corporation perspective*, points out that within the IS development industry, incumbent system developers (hubs) are increasingly embracing partnerships with less well established companies acting in specific niches (spokes). This paper seeks to develop a better understanding of the motives for this strategy. Relying on existing work on strategic alliance formation, three categories of capabilities are identified and analyzed through a single-case study. The case represents a market leader in the global IS development industry, which fosters a network of smaller partner firms. The study reveals that temporal dynamics between the identified factors exist in these networks. A cyclical partnership model is developed that attempts to explain the life cycle of partnerships within such a network.

In the paper by Tuure Tuunanen, Michael Myers and Harold Cassab entitled *challenges of consumer information systems development: the case of interactive television services*, the authors suggest that a new type of information system appears to be increasing in importance, that of consumer information systems. Compared with traditional information systems development approaches, where the focus is on improving the efficiency and effectiveness of organizational processes, the design of consumer information systems focuses more on the enjoyment, pleasure and purchases of the consumer. The authors argue that the shift in focus from users to consumers in consumer information systems calls for a significant re-appraisal of our current information systems development methods. Hence, this paper proposes a new research agenda for IS researchers using design science research and enabling a more holistic evaluation of consumer information systems.

Defining, Modelling and Diffusing IS Projects

Ronell Alberts and Vreda Pieterse assert that diffusion of information technology in a developing world context is difficult due to the fact that most of the targeted communities are in market neglect environments. In their paper, *improving diffusion of Information Technology in communities in a developing world context*, they characterize market neglect environments as those that fail to make an economic market and have an economic impact because the prospect for immediate or even intermediate return on investment is low given that the client base is small or with little economic power. Software development for market neglect areas face a number of unique challenges while at the same time needing (perhaps more than in developed economies) to produce products of high quality, on budget and on time. In their paper, the authors' aim to identify the unique problems experienced when developing for market neglect environments and to identify tools and methods needed in for software development methodology to address these problems in order to improve the diffusion of information technology in market neglect economies.

The next paper in this category is entitled *'Driving' IS projects* by Marta Fernández-Diego and Julián Marcelo-Cocho. This paper begins with a discussion of complexity and uncertainty as determinants of IS project success and the relation to 'right' and 'left' brain notions of problem solving. The authors then review different auto racing circuits as metaphors for 'driving' an IS project to completion and dealing with the accompanying complexity and uncertainty. For example, drivers on an oval track have a very different support structure and exposure to risk and complexity than do drivers on off-road rallies. These metaphors provide interesting perspectives for IS project development and management.

The paper by Viera Rozinajova, Marek Braun, Pavol Navrat and Maria Bielikova, *bridging the gap between service-oriented and object-oriented architectures in information systems development*, is the last paper in this grouping. Service-oriented architecture is

currently one of the most promising technologies in the area of information systems development, whereas the most popular development methodology of the last decade was object-oriented. The goal of this paper is to investigate the possibility of enhancing object-oriented methodology with service-oriented architecture.

Knowledge Management and Business Intelligence

During the last few years much emphasis in organisations has been given to the capture and retention of knowledge and business intelligence, and this forms the fourth of our conference themes. Our first paper in this grouping is *requirements elicitation in data mining for business intelligence projects* by Paola Britos, Oscar Dieste and Ramon Garcia-Martinez. The authors argue that there are no suitable data mining methodologies for business intelligence. They argue that the classical software engineering approach is not completely suitable for data mining for business intelligence because it neglects the requirements specification aspects of the project. The authors propose a data mining business intelligence elicitation process and show how requirements can be educed by their proposal.

William Dixon argues that little is known about how people, contexts, and tools impact decisions to use a Knowledge Management System (KMS) in his paper *social networks and knowledge management systems use in US IT services*. The purpose of his study is to understand information retrieval better when solving difficult problems. Key research questions focus on social structure, interpersonal relationships, and the nature of the KMS. In this sequential exploratory study, semi-structured interviews were conducted and questionnaires distributed in a large accounting firm. Social structure analysis showed fewer structural holes within networks among routine KMS users. Contrary to social resource theory, information was rarely sought from supervisors. Reciprocal information exchange accompanied asking for help, but not when information was retrieved from the KMS. The KMS facilitated the distribution of information and enabled learning, but was not uniformly adopted. Recommendations for practice include the strategic

designation of experts and refinement of mechanisms available for information retrieval.

Business Intelligence (BI) remains one of the top priority issues for CIOs and investment in BI technologies continues to grow. Derek Smith and Maria Crossland in their paper *realizing the value of business intelligence* attempt to understand how an organization can realize and measure the business value derived from their investment in BI. A single, in-depth case study was undertaken in a major South African financial services organization. The study found that the realization of business value from BI is highly dependent on activities that occur in all stages of the process model – from the alignment of the BI and organizational strategy to the way the business measures the benefits of BI.

Applications and Emerging Technologies

Information systems is about how the new technology fits in with people, organizations and society, and it is fitting that our last theme looks at emerging technologies that will impact us in the next few years. Lisa Seymour, Emma Lambert-Porter and Lars Willuweit discuss one such technology in their paper *towards an RFID adoption framework: a container supply chain analysis*. While the benefits of RFID (radio frequency identification) in supply chains have had extensive press, there are few publicised cases showing poor returns on investment. This qualitative study in the South African port community refines and extends an RFID adoption framework and provides insight into the factors potentially affecting the adoption of this new technology as well as the probability of adoption in that community. Four new factors not previously mentioned in research were identified: related initiatives; the integrated structure of the industry; organisational dominance with the supply chain and the supply chain culture. The research reveals that cost, the absence of a universally-adopted standard and the supply chain culture are currently the major impediments to RFID adoption in the South African port community.

The deliberations of our working group on information systems in public administration (WG8.5) is well represented in the two papers on e-government. Ilse Baumgartner and Peter Green report on a case study which focuses on the question: what are the critical factors that influence IT professionals' intention to adopt the Service Oriented Computing (SOC) paradigm? Their paper, *adoption of service oriented computing from the IT professionals' perspective: an e-Government case study*, examines the e-Government initiative in a middle-sized European city. It uses an initial SOC adoption model developed through a proceeding interview-based exploratory study. The current study has two principle aims. The first aim is to "shed some light" on the IT professionals' acceptance of such complex technological approaches as Service-Oriented Computing in the e-Government sector and to report key learning factors that emerge from the case study. Their case study also aims to bring further credibility to their first study and to validate its assertions. As such, some of the major findings of the study are the replacement of the complexity variable by the variable of maintainability, and the replacement of the trust and dependency variables (both of interpersonal rather than of technical nature) by the variable of external involvement. The results of the study also suggest the introduction of the "champion" of the approach variable.

John Krogstie looks at the reasons why the introduction of the Internet Marketplace – eHandel.no – has thus far failed to be a success in the County Municipality of Sør-Trøndelag, as compared to the original ambitions regarding usage volume for this channel. In his paper, *introduction of a public sector e-procurement solution: lessons learned from disappointing adoption*, he uses various acceptance theories to analyze why users fail to accept eHandel.no. The theories were utilized prior to the interviews in order to formulate interview questions. Afterwards the same theories were used to analyze the results. The results indicate that good product catalogues, motivated users, compulsory use of the system, and renegotiation of contracts with the suppliers are some of the most important prerequisites in order to achieve success using eHandel.no.

Further Reflections

In organizing an international conference many people put in a great deal of time and effort in ensuring its success. We first wish to recognize two colleagues, Bill Olle and A. Min Tjoa, members of IFIP Technical Committee 8 who helped us greatly in the early stages and we are very grateful for this support. The Chairs and Committee Members of the various working groups within IFIP TC8 acted as associate editors and we would particularly like to mention the help of this group and the following individuals. Neither this conference nor the proceedings can happen without the commitment of these individuals to the profession.

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