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Jeffrey Parsons
Memorial University of Newfoundland, jeffreyp@morgan.ucs.mun.ca

Juhani Iivari
University of Oulu, juhani.iivari@oulu.fi

Alan R. Hevner
University of South Florida, ahevner@usf.edu

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Communications of the Association for Information Systems

RESEARCH IN INFORMATION SYSTEMS ANALYSIS AND DESIGN: INTRODUCTION TO THE SPECIAL THEME PAPERS

Juhani Iivari
Department of Information Processing Science
University of Oulu

Jeffrey Parsons
Faculty of Business Administration
Memorial University of Newfoundland

Alan R. Hevner
College of Business Administration
University of South Florida
ahevner@coba.usf.edu

ABSTRACT

Information systems analysis and design are basic topics in the Information Systems (IS) curriculum. A large number of IS graduates are employed as information systems developers. However, research in the IS field pays relatively little attention to IS analysis and design topics. Few of the articles published in leading IS research journals in the last decade deal with these topics In response, CAIS and JAIS are jointly presenting Special Themes on Research in Information Systems Analysis and Design to begin to fill this void and to attract attention of researchers to this important area.

KEYWORDS: information systems analysis and design, design science, special theme papers.

I. INTRODUCTION

Information systems analysis refers to a number of activities in the early stages of information systems development. The main purpose of systems analysis is to identify and document the requirements for an information system to support organizational activities. Information systems design refers to the process of defining the software architecture, components, modules, interfaces, and data for a software system to satisfy requirements specified during systems analysis. The majority of system failures can be attributed to problems that arise during the systems analysis and design phases. Hence, understanding and improving systems analysis and design are central to the research mission of the Information Systems (IS) discipline.

Systems analysis and design are basic topics in the IS curriculum. A large number of IS graduates become information systems developers. However, research in the IS field pays relatively little attention to systems analysis and design. Vessey, Ramesh, and Glass (2002) showed that few of the articles published in five leading IS journals from 1995 to 1999 dealt with these topics. Bajaj et al. (2005) identified the need for greater alignment between research and teaching in information systems analysis and design. The Journal of AIS (JAIS) and The Communications of AIS (CAIS) created a special joint theme to begin to draw attention to the misalignment and to attract the attention of more researchers to this important area.

II. DEVELOPING THE SPECIAL THEME

A proposal for the special theme was developed with close cooperation between CAIS and JAIS. Alan Hevner and Yair Wand served as Senior Editors for CAIS and JAIS, respectively, and Juhani Iivari and Jeffrey Parsons served as Guest Editors for both journals. The submission deadline was March 1, 2005. Submissions were solicited via ISWORLD and SIGSAND-L (the listserve of the AIS Special Interest Group on Systems Analysis and Design). Authors could indicate whether their submissions were intended for CAIS or for JAIS; otherwise, assignments were made by the editors. The editors reserved the right to determine whether each submission was more appropriate for CAIS or JAIS.

A total of 24 submissions to the special theme were received. Ten submissions entered the CAIS review process and 14 were directed to JAIS. Of the 10 considered for CAIS, four were accepted for inclusion in this issue. The papers accepted for the special theme in JAIS are expected to be published mid-2006.

III. CONTENTS OF THIS ISSUE

The four papers accepted for CAIS, which follow, cover the special theme of Research in Information Systems Analysis and Design.

SYSTEMS ANALYSIS AND KNOWLEDGE MANAGEMENT

Bera, Nevo, and Wand (Volume 16, Article 41) contribute to the recently recognized problem of how to integrate knowledge management with business processes. The authors propose a method for Knowledge Requirements Analysis (KRA) that combines process and knowledge analysis, and illustrates the method in a case of processing ethical review applications in a university. The KRA method comprises modeling the business processes, making visible the explicit and tacit knowledge included and required in the processes, analysis of knowledge deficiencies and improvements, and consequent process redesign. The authors emphasize the knowledge embedded in the business processes. They point out that in redesigning business processes an organization may be at risk of losing important knowledge. This risk is obvious especially in the case of the “knowing-how” type of knowledge that is deeply embedded in the skillful and fluent performance of the processes. The KRA method implicitly trusts that making visible the explicit and tacit knowledge required in the business processes, together with the awareness of the risk, are means to reduce the danger of destroying valuable knowledge in business process redesign.

DATA MODELING vs. FUNCTIONAL MODELING

Shoval and Kabeli (CAIS Volume 16, article 42) examine the largely neglected questions of the impact of the order of modeling activities (data modeling versus functional modeling) on the quality of specifications developed. In an experiment with student participants, they find that the quality of data models is better when participants start with data modeling than when they start with functional modeling. In addition, the participants believe it is preferable for analysts to begin with data modeling. This research contributes to our understanding of process issues in modeling

during information systems analysis and design, and provides implications for both teaching and practice.

SYSTEMS ANALYSIS AND DESIGN CURRICULUM

Mahapatra, Nerur, and Slinkman (CAIS Volume 16, Article 43) contribute to an ongoing debate over the IS curriculum. Through a survey of IS programs at AACSB-accredited business schools, they identify a mismatch in the content of programming courses (which focus on object-oriented (OO) concepts) and systems analysis and design courses (which focus on structured analysis and design techniques). They make a strong case for moving from structured to OO approaches in systems analysis and design courses. They also offer suggestions for making that transition, which include the need for greater involvement in systems analysis and design research among IS faculty who teach this subject.

EVALUATING IS DEVELOPMENT METHODOLOGIES

Siau and Tan demonstrate that the evaluation of existing information systems development (ISD) methodologies is not keping pace with the rapid growth of ISD methodologies. They suggest an empirically derived set of 32 evaluation criteria for information systems development methodologies; classifying the criteria in three categories – methodology design, methodology use, and methodology deliverables. The criteria are derived using a systematic content analysis of expert opinions from 28 researchers and practitioners collected using electronic brainstorming. The paper makes a significant contribution by making the development of evaluation frameworks an empirical issue. Using an analogy with the development of measurement instruments, the paper is the first step toward assuring reasonable content validity of the criteria. Additional research is needed to empirically test the construct and the predictive validity of the proposed evaluation criteria.

IV. CONCLUSIONS AND RESEARCH DIRECTIONS

In their recent CAIS paper, Bajaj et al. (2005) call on the IS academic community to devote more attention to advancing knowledge in information systems analysis and design through rigorous research on both foundational issues and topics of current interest among practitioners and to transition the value of this research into the teaching of students in SA&D classes. The publication of these four papers in the CAIS/JAIS special theme is a promising start for increasing the visibility and quality of analysis and design research in IS.

Editor's Note: This paper is an introduction to a series of articles in the Research in Information Systems Analysis and Design series guest edited by Juhani Iivari and Jeffrey Parsons. Alan Hevner served as the CAIS senior editor for the series. Some of the papers in this series are being published in JAIS and some in CAIS; the choice depending on the topic and approach of the paper. This paper was published on December 8, 2005.

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ABOUT THE AUTHORS

Juhani Iivari is Professor in Information Systems at the University of Oulu, Finland, and the Scientific Head of the INFWEST.IT Postgraduate Education Program of five Finnish Universities in information systems. He received his M.Sc. and Ph.D. degrees from the University of Oulu. He also served as the national coordinator of the Finnish Doctorate Programme in Information Systems 1993-1994. Dr. Iivari is the national representative of Finland in IFIP (International Federation of Information Processing) Technical Committee 8. He serves in editorial boards of seven journals. His research focuses broadly on theoretical foundations of information systems, information systems development methodologies and approaches, organizational analysis, implementation and acceptance of information systems, and the quality of information systems.

Jeffrey Parsons is Professor of Information Systems and the Associate Dean (Research) in the Faculty of Business Administration at Memorial University of Newfoundland. He received a Ph.D. from The University of British Columbia in 1992. His research interests include systems analysis and design, database management, and the Semantic Web. His research is published in journals such as *Management Science*, *Communications of the ACM*, *ACM Transactions on Database Systems*, *Journal of Management Information Systems*, and *IEEE Transactions on Software Engineering*. Dr. Parsons is a member of the editorial boards of *Journal of the Association for Information Systems* and *Journal of Database Management*, and is a member of the AIS, ACM, INFORMS, and the IEEE Computer Society.

Alan R. Hevner is Eminent Scholar and Professor in the Information Systems and Decision Sciences Department in the College of Business Administration at the University of South Florida. He holds the Citigroup/Hidden River Chair of Distributed Technology. Dr. Hevner's areas of research interest include information systems development, software engineering, distributed database systems, healthcare information systems, and telemedicine. He os the author of over 120 research papers on these topics and a consultant for Fortune 500 companies. Dr. Hevner received a Ph.D. in Computer Science from Purdue University. He previously served on the faculties of the University of Maryland and the University of Minnesota. Dr. Hevner is a member of ACM, IEEE, AIS, and INFORMS.

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