

Lecture Notes in Business Information Processing

249

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Advanced Information Systems Engineering Workshops

CAiSE 2016 International Workshops
Ljubljana, Slovenia, June 13–17, 2016
Proceedings

Editors

John Krogstie
Department of Computer and Information
Science
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Technology
Trondheim
Norway

Haralambos Mouratidis
University of Brighton
Brighton
UK

Jianwen Su
Department of Computer Science
University of California
Santa Barbara, CA
USA

ISSN 1865-1348 ISSN 1865-1356 (electronic)
Lecture Notes in Business Information Processing
ISBN 978-3-319-39563-0 ISBN 978-3-319-39564-7 (eBook)
DOI 10.1007/978-3-319-39564-7

Library of Congress Control Number: 2016940335

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Printed on acid-free paper

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The registered company is Springer International Publishing AG Switzerland

Preface

The Conference on Advanced Information Systems Engineering (CAiSE) has traditionally focused on aspects that intersect our field – technological and human, theoretical and applied, organizational and societal. The theme for CAiSE 2016 of “Information Systems for Connecting People” emphasized the wish to satisfy the needs and requirements of people, both as individuals and as parts of organizations, which are socio-technical systems. To further the research on these areas, it is important also to provide arenas where researchers can meet.

Each year CAiSE is accompanied by a significant number of high-quality workshops. Their aim is to address specific emerging challenges in the field, to facilitate interaction between stakeholders and researchers, to discuss innovative ideas, as well as to present new approaches and tools.

The 28th CAiSE was held in Ljubljana, Slovenia, June 13–17, 2016. This year, CAiSE had three associated working conferences (BPMDS, EMMSAD, and ICSOB) and seven workshops. The accepted workshops were chosen after careful consideration, based on maturity and compliance with our usual quality and consistency criteria providing a balanced set of events. This volume contains the proceedings of the following five workshops of CAiSE 2016 (in alphabetical order):

- The Third International Workshop on Advances in Services Design Based on the Notion of Capability (ASDENCA) co-arranged with the First International Workshop on Business Model Dynamics and Information Systems Engineering (BumDISE)
- The Fourth International Workshop on Cognitive Aspects of Information Systems Engineering (COGNISE)
- The First International Workshop on Energy Awareness and Big Data Management in Information Systems (EnBIS)
- The Second International Workshop on Enterprise Modeling (EM)
- The Sixth International Workshop on Information Systems Security Engineering (WISSE)

The 12th International Workshop on Enterprise and Organizational Modeling and Simulation (EOMAS) published proceedings in a separate LNBIP volume. The Second International Workshop on Socio-Technical Perspective in IS Development (STPIS) published their proceedings in the CEUR Workshop Proceedings series. Each workshop adhered to the CAiSE 2016 submission and acceptance guidelines. The paper acceptance rate for the workshops included in these proceedings was approximately 49 %.

As workshop chairs of CAiSE 2016, we would like to express our gratitude to all the workshop organizers and to all the corresponding scientific committees of the workshops for their invaluable contribution.

April 2016

John Krogstie
Haralambos Mouratidis
Jianwen Su

Third International Workshop on Advances in Services Design Based on the Notion of Capability – ASDENCA 2016

Preface

The notion of *capability* has been gaining much presence within the field of information systems engineering, owing to a number of factors: the notion directs the focus of business investment, it can be used as a baseline for business planning, and it leads directly to service specification and design. Historically, it has been examined in economics, sociology, and management science. More recently, it has been considered in the context of business-IT alignment, in the specification and design of services using business planning as the baseline.

Capability is commonly seen as an *ability* or *capacity* for a company to deliver value, either to customers or shareholders, under the business strategy. It consists of three major components: business processes, people, and physical assets.

Thus it is as an abstraction away from the specifics of how (process), who (agent), and why (goals), i.e., with a focus on results and benefits. At the same time, capability should allow fairly straightforward integrations with the established bodies of knowledge and practices, such as goals (through “goal fulfilment”), processes (through “modelling”), and services (through “servicing”).

The idea for the ASDENCA workshop has come from the academic and industrial community gathered at the recently launched EU/FP7 project – CaaS. In its third year, ASDENCA is taking an interest in “capability” as a new modelling paradigm going beyond well-established processes and services and being a candidate to manage sustainability, adaptation, and flexibility of enterprise IS in the presence of often changing business conditions. At the same time, the workshop will try to gather and further enlarge scientific and practitioner communities interested in getting a chance to discuss and advance the theories and practices related to an emerging means for solving nontrivial challenges of managing enterprise IS.

The Program Committee selected five high-quality papers for presentation at the workshop, which are included in this proceedings volume. ASDENCA 2016 was run together with BUMDISE 2016. Divided into four sessions, the program of the workshop included three paper sessions and a discussion panel.

We owe special thanks to the workshop chairs of CAiSE 2016 for supporting the ASDENCA workshop, as well as for providing us with facilities to publicize it. We also thank the Program Committee, for providing valuable and timely reviews for the submitted papers.

April 2016

Jelena Zdravkovic
Oscar Pastor
Peri Loucououlos

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First International Workshop on Business Model Dynamics and Information Systems Engineering (BumDISE 2016)

Preface

Over the last two decades, the business model (BM) has received increasing attention and progressively established itself as a new dimension of innovation.

The study of BMs involves exploring and making sense of how firms do business at the system level. It encompasses new forms of organizing, of creating and of capturing value, often involving network plays facilitated by the development of information and communication technologies (ICT). The study of business model innovation (BMI) involves exploring and clarifying the nature of the mechanisms and dynamics underlying the emergence and evolution of BMs with an emphasis on both the design of new BMs and the reconfiguration or renewal of existing ones. Thus, BMI can be theoretically framed in terms of three broad task domains: discovering opportunities for new BMs (sensing), designing new BMs (seizing), and developing (transforming) a BM.

The Business Model Dynamics and Information System Engineering (BumDISE) workshop, powered by the Swiss National Science Foundation Sinergia project 147666, builds on these considerations to explore the potential of a cross-fertilization of insights from seemingly siloed disciplines such as strategy and organization theory on the one side and information systems engineering on the other side. While these domains clearly have a conceptual overlap, they have looked at the BM in isolation and from somewhat different angles. And yet, they seem to share a common ground in relationship to the BM, namely, the BM as a (complex) system orchestrated around information exchange (both formal, technology mediated and informal). Thus an opportunity exists to shed light on the phenomena underlying BMI by embracing a discussion encompassing these domains.

Gianni Lorenzoni's paper explores the dynamics of the BMs adopted by firms operating in the fast fashion business, which he defines as "offering fashionable products at a cheap or very cheap price [...] trying to capture trends rather than imposing them, [...] often over limited amounts of time." It is suggested that the strategic logic of the fast fashion segment, namely, introducing a complementary model to the one adopted by the traditional fashion industry and based on imposing trends by systematically introducing new seasonal products in advance, is, to some extent, trivial or more understood. What is less evident is the role of information processing capabilities in running such a model efficiently. Firms adopting the "fast fashion" BM are asset light, relying on and orchestrating a network of third-party manufacturers that have to respond very quickly to new requests. The study suggests that the key capability is information processing and the quick transformation of insights and signals relative to new trends into products and the ability to make this process an

efficient routine. The generic configuration of the BM puts in evidence the restriction of the activity boundaries to some central components, while operating in a setting of distributed knowledge and competencies. Relational capabilities are key in that they improve information processing. Overall the paper suggests that to understand the functioning of BMs, the black box of the organization behind it should be opened and analyzed carefully.

Cattaneo and Hacklin suggest a similar perspective on the study of BM, namely, the importance of organizational-level dynamics for its study, but concentrate on the interplay of strategy and innovation in relationship to renewal. They study offers to focus on Bang & Olufsen, a Danish high-end producer of consumer electronics, which has experienced both success and failure in the process of strategic renewal, challenged by blurring industry boundaries and the rise of the digital technology paradigm. The authors conducted extensive ethnographic research (more than 40 days on site), which allowed them to study the company in the process of redefining its BM. The study suggests that the process of organizational renewal associated with discovering a new BM is carried out through actions of individuals and their inter-subjective relationships, influenced by both organizational context and their personal characteristics. It also suggests that such a process follows cycles between the domains of strategy and innovation. More specifically, the assessment against the external context triggers and informs subsequent organizational design challenges.

Finally, the paper by Achi, Salinesi, and Viscusi questions how to evaluate the level of maturity of an organization with respect to information systems-based innovation. In particular, the authors investigate the salient features of ICT-centered innovation maturity models. To this end, a comparative review is carried out on 16 innovation maturity models collected both from the professional and the academic literature.

We hope these papers will provide insights and ideas to both academics and practitioners suitable to support further investigation and experimentation for solutions bridging the academic silos between disciplines such as strategy and organization theory on the one side and information systems engineering on the other side. BUMDISE 2016 was arranged together with ASDENCA 2016.

April 2016

Lorenzo Massa
Christopher Tucci
Gianluigi Viscusi

BumDISE 2016 Organization

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Lorenzo Massa	WU, Austria and EPFL, Switzerland
Christopher Tucci	EPFL, Switzerland
Gianluigi Viscusi	EPFL, Switzerland

Program Committee

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Fredrik Hacklin	ETH, Switzerland
Gianni Lorenzoni	University of Bologna, Italy
Alessandro Lomi	University of Svizzera Italiana, Switzerland
Simone Ferriani	University of Bologna, Italy

Fourth International Workshop on Cognitive Aspects of Information Systems Engineering (COGNISE 2016)

Preface

Cognitive aspects of information systems engineering is an area that is gaining interest and importance in industry and research. In recent years, human aspects and specifically cognitive aspects in software engineering and information systems engineering have received increasing attention in the literature and conferences, acknowledging that these aspects are as important as the technical ones, which have traditionally been at the center of attention. This workshop was planned to be a stage for new research and vivid discussions involving both academics and practitioners.

The goal of this workshop is to provide a better understanding and more appropriate support of the cognitive processes and challenges practitioners experience when performing information systems development activities. Understanding the challenges and needs, educational programs, as well as the development of supporting tools and notations may be enhanced for a better fit to our natural cognition, leading to a better performance of engineers and higher system quality. The workshop aimed to bring together researchers from different communities such as requirements engineering, software architecture, design and programming, and information systems education, who share an interest in cognitive aspects, for identifying the cognitive challenges in the diverse development-related activities.

The fourth edition of this workshop, held in Ljubljana on June 14, 2016, was organized in conjunction with the 28th International Conference on Advanced Information Systems Engineering (CAiSE 2016). This edition attracted 11 international submissions. Each paper was reviewed by three members of the Program Committee. Of these submissions, five papers were accepted for inclusion in the proceedings (45 %). The papers presented at the workshop provide a mix of novel research ideas, presenting full research, research in progress, or research plans.

We hope that the reader will find this selection of papers useful to be informed and inspired by new ideas in the area of cognitive aspects of information systems engineering. We look forward to future editions of the COGNISE workshop following the four editions we had so far.

June 2016

Irit Hadar
Barbara Weber

COGNISE 2016 Organization

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Barbara Weber	Technical University of Denmark/ University of Innsbruck, Austria

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Stefan Zugal	University of Innsbruck, Austria

First International Workshop on Energy-Awareness and Big Data Management in Information Systems – EnBIS 2016

Preface

Information systems are the basis for each organization. Recently, the amount of services has increased exponentially. To improve their efficiency and reduce costs, modern organizations are shifting their services to the cloud. Lower costs are increasing the demand for cloud services with a consequent increment in the size and kind of information to be stored, processed, and analyzed. A question is arising and is becoming a driver for innovation: “Is it sustainable?”

Energy demand is an important challenge that cannot be disregarded. Over the last decade, data center performance has increased tremendously without proportional energy efficiency. This issue is intensified by the increasing demand for cloud services, together with an inefficient usage of the resources. Also, the environment in which the information systems of modern organizations operate is characterized by a growing generation of data due to the pervasiveness of sensors and devices producing a wide range of information. These data can be of interest for the strategic decisions of the organization and need to be treated properly. Collecting, storing, and analyzing data, which have the features of big data (volume, velocity, variety), is highly expensive in terms of energy. Although this issue has been widely studied, there are still many open challenges. The attention to sustainability is motivated by several reasons. First of all, reducing energy consumption minimizes IS management costs, allowing organizations to save money and increase their competitiveness. Moreover, the environmental issue cannot be disregarded anymore, as the appeal of an organization is influenced by its behavior in terms of sustainability. In this context, it is clear that energy-awareness and energy-efficiency of ISs are important features for the organization that have to be enhanced while maintaining quality of service.

The goal of the EnBIS workshop, organized in conjunction with the 28th Conference on Advanced Information Systems Engineering (CAiSE 2016), was to tackle the energy-awareness of cloud-based business activities, from application to resource management, and to promote collaboration between scholars interested in the topic.

For the first year of the workshop, we received six submissions from researchers in different fields of information systems and business process management communities. Each paper was peer-reviewed by three members of the Program Committee. Out of these submissions, the Program Committee selected three high-quality papers for presentation during the workshop, which are included in this proceedings volume. The work by Pinarer et al. focuses on energy-aware dynamic sensor reconfiguration to minimize energy consumption in smart building systems. The second contribution, also in the smart buildings area, by Sora et al., introduces a platform able to micro-account the energy consumption of devices and presents two case studies for its usage.

Finally, the work by Cappiello et al. proposes a model to predict the CO₂ emissions of cloud data centers connected to the national grid. As can be seen, these contributions advance the state of the art in the area of energy efficiency in information systems. The program of the workshop included one introduction talk held by the Program Committee chairs, one paper session reflecting important topics of Green IS management, and a discussion panel.

April 2016

Monica Vitali
Marina Zapater

EnBIS 2016 Organization

Organizing Committee

Monica Vitali	Politecnico di Milano, Italy
Marina Zapater	Universidad Complutense de Madrid, Spain

Program Committee

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Second International Workshop on Enterprise Modeling (EM 2016)

Preface

Enterprises today face many challenges including recent trends such as enterprise mobility, cloud computing, the Internet of Things, cyber-physical systems, and factories of the future. For the development of innovative solutions in this context, a number of aspects need to be taken into account. These range from the mastering of new technologies, the integration and interoperability of heterogeneous systems, to organizational aspects such as the adaptation of business processes or the acquisition of knowledge from decision makers and its transformation into products and services. Enterprise modeling offers concepts for coping with these challenges. By providing machine-processable languages for representing and analyzing complex business and technological scenarios, by engaging in knowledge management, and by supporting organizational engineering, enterprise modeling offers a wide range of options for designing, implementing, and evaluating new solutions. Thereby it spans from traditional fields such as business process management and business intelligence to more recent areas such as enterprise architecture and semantic information systems.

The aim of the Second International Workshop on Enterprise Modeling, which was again organized in conjunction with the International Conference on Advanced Information Systems Engineering (CAiSE 2016), was to bring together researchers working on innovative approaches for enterprise modeling. For this second issue of the workshop we received seven papers. From these papers three were selected based on at least two peer-reviews from an international Program Committee.

The papers take up current research topics in the area of enterprise modeling. The paper by Janssens et al. is positioned in the area of decision modeling and discusses the formalization of decisions in a business context as well as execution mechanisms for different input data. Hinkelmann et al. propose the concept of business processes as a service for aligning business processes with IT in cloud environments and discuss mechanisms for facilitating the alignment via modeling. Finally, Bettacchi et al. present an industry case study from the area of manufacturing where they compared and evaluated different algorithms for process mining.

The workshop organizers would like to thank the authors for their contributions and the members of the Program Committee and additional reviewers for their timely and thorough reviews. Furthermore, our thank goes to the workshop chairs and organizers of CAiSE 2016 for hosting the workshop.

March 2016

Hans-Georg Fill
Dimitris Karagiannis
Manfred Jeusfeld
Matti Rossi

Enterprise Modeling Workshop 2016 Organization

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The Sixth International Workshop on Information Systems Security Engineering (WISSE 2016)

Preface

Information systems security problems are currently a widespread and growing concern that covers most areas of society, such as business, domestic, financial, government, health care, etc. The scientific community has realized the importance of aligning information systems engineering and security engineering in order to develop more secure information systems. Nevertheless, there is lack of an appropriate event that will promote information systems security within the context of information systems engineering. The proposed workshop fills this gap.

The International Workshop on Information System Security Engineering (WISSE) aims to provide a forum for researchers and practitioners to present, discuss, and debate, on one hand, the latest research work on methods, models, practices, and tools for secure information systems engineering, and, on the other hand, relevant industrial applications, recurring challenges, problems and industry-led solutions in the area of secure information systems engineering.

This sixth edition of the workshop, held in Ljubljana (Slovenia) on June 13, 2016, was organized in conjunction with the 28th International Conference on Advanced Information Systems Engineering (CAiSE 2016). In order to ensure a high-quality workshop, following an extensive review process, six submissions were accepted as full papers addressing a large variety of issues related to secure information systems engineering.

We wish to thank all the contributors to WISSE 2016, in particular the authors who submitted papers and the members of the Program Committee, who carefully reviewed them. We express our gratitude to the CAiSE 2016 workshop chairs, for their helpful support in preparing the workshop. Finally, we thank our colleagues from the Steering Committee, Jan Jürjens and Carlos Blanco, and our Publicity Chairs, Michalis Pavlidis, Luis Enrique Sánchez, and Akram Idani, for initiating the workshop and contributing to its organization.

April 2016

David G. Rosado
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Vasilis Katos	Bournemouth University, UK
Yves Ledru	LIG, University of Grenoble, France

Additional Reviewer

Efstathios Stamatatos	University of the Aegean, Greece
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