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Perspectives in Business Informatics Research

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Preface

Business informatics is a discipline that combines information and communication technology (ICT) with the knowledge of management. It is concerned with the development, use, application, and the role of management information systems and all other possible ways of using ICT in the field of management. It is also an important interdisciplinary academic and research discipline. The Perspectives in Business Informatics Research (BIR) conference series was established 16 years ago as a result of a collaboration of researchers from Swedish and German universities in order to create a forum where researchers in business informatics, both senior and junior, could meet and hold discussions. The conference series is led by the Steering Committee, to which one or two persons from every appointed organizer are invited.

To date, BIR conferences were held in: Rostock (Germany – in 2000, 2004, 2010), Berlin (Germany– 2003), Skövde (Sweden – 2005), Kaunas (Lithuania – 2006), Tampere (Finland –2007), Gdańsk (Poland – 2008), Kristianstad (Sweden – 2009), Riga (Latvia – 2011), Nizhny Novgorod (Russia – 2012), Warsaw (Poland – 2013), Lund (Sweden – 2014), Tartu (Estonia – 2015), and Prague (Czech Republic – 2016). This year's 16th International Conference on Perspectives in Business Informatics Research (BIR) was held during August 28 – 30, 2017, in Copenhagen, organized and hosted by the Center for Industrial Production, Aalborg University, Denmark

This year the BIR conference attracted 59 submissions from 23 countries. They were reviewed by 45 members of the Program Committee. As the result, 17 full papers and three short papers were selected for presentation at the conference and publication in this volume. The papers presented at the conference cover many important aspects of business informatics research.

This year, the conference theme was the digital transformation. The challenges and opportunities for the digital transformation driven by the fourth industrial revolution was the central theme for the World Economic Forum summit last year. Industry 4.0 has been used to characterize the shift in society, enabled by connectivity and convergence of physical, digital, and biological technologies. This digital transformation will impact most businesses, organizations, and societies and call for new and radical approaches to how we adopt, use, and manage IT.

The main conference was also accompanied by satellite events: A pre-BIR forum, two workshops, and a doctoral consortium took place during the first day of the conference.

We would like to thank everyone who contributed to the BIR 2017 conference. First of all, we thank the authors for presenting their papers, we appreciate the invaluable contributions from the members of the Program Committee and the external reviewers, and we thank all the members of the local organization team from Aalborg University, for their help in organizing the conference. We acknowledge the EasyChair

development team for providing a valuable tool for preparing the proceedings and the Springer publishing team for their excellent collaboration. Last but not the least, we thank the Steering Committee for directing the BIR conference series.

June 2017

Björn Johansson
Charles Möller

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BIR2017_Keynotes

Industry 4.0 and Smart Production

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The industrial world undergoes a paramount change, which is accelerated by massive digitalization. Although the headlines sound different as Industrial Internet of Things (IIoT) in the US, Made in China 2025 or Industry 4.0 in Europe, the challenges and applicable technological solutions with focus on production systems, commonly named Cyber Physical Production Systems (CPPS), are redundant.

Actual tasks are to strengthen the versatility of production equipment and processes in the context of the progressive dynamism of the markets, where approaches like CPPS become in first step necessary regarding the automation of processes. These strategies are intended to increase productivity and efficiency of a company or a business for a long-term period. However, the further changing business conditions will lead to shorter planning cycles and mass customization trends would increase the number of variants down to smallest lot sizes or one-of-a-kind products. Some of these challenges can be solved with the implementation of CPPS. However, in order to comply with more dynamic requirements and also considering cognition and knowledge based aspects, the learning, training and assistance capabilities of the human work force with respect to CPPS has to be significantly upgraded.

As a vision, the combination of CPPS and real-time networking of people, machines, objects and ICT systems would allow a dynamic management and handling of complex production systems. These systems would include software-intensive units and devices (from Big Data to Smart Data), which represent the integration of data, services and comprehensive solutions in order to connect physical and digital systems to each other. In consequence, this vision would lead to a Smart Industrial Ecosystem (SIE).

In order to establish, evaluate and implement such SIE's, there has been established several Industry 4.0 in Europe. They cover research, development and transfer of results aspects. One of them, the Innovation Center Industry 4.0 in Brandenburg (IMI), part of the national Platform Industry 4.0 in Germany, is following this strategy and thus build up on three core elements, which are: 1) The Model Factory, providing showroom and hands on shop floor for advanced technologies; 2) The Innovation Lab, transferring R&D results into practical industrial requirements; and 3) The Knowledge Forum, acting as learning, training and assistance sphere for all staff levels.

During three years of practical work, the IMI has already performed innovation projects with over 100 industrial clients, BIG and SME companies. There have been developed unique consultancy formats as e.g. the Industry 4.0 Check-Up, which analyses and determines the maturity levels in the field of Industry 4.0 and the Industry 4.0 Road Map, which defines the eight migration steps towards Industry 4.0, keeping the individual KPI requirements in mind.

The speech will analyze and describe the building blocks and application sectors of CPPS in industrial environments. It will further reflect the requirements and migration paths towards Smart Industrial Ecosystems and Smart Production systems. The discussion of selected use cases, related from the work of the IMI, including implementation strategies and results will highlight the practical aspects of the speech.

Digital Transformation of Industry Research Challenges and Opportunities in Smart Production

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The central theme of the 16th International Conference on Perspectives in Business Informatics Research is digital transformation. Digital transformation refers to the profound change associated with the adoption of digital models in all aspects of business, society and life in general.

In business, digital transformation opens up to numerous innovative and potential disruptive business models. Industry has traditional been quite conservative, however these years manufacturing and production is undergoing massive digital transformation. The industrial challenges and opportunities for the digital transformation driven by the fourth industrial revolution was the central theme for the World Economic Forum summit last year.

Industry 4.0 has been used to characterize the shift in society, enabled by connectivity and convergence of physical, digital and biological technologies. This digital transformation will impact most businesses, organizations and societies and call for new and radical approaches to how we adopt, use and manage IT. Industry 4.0 is best characterized as a joint research and innovation program designed to support the re-industrialization of Germany. This is an agenda similar to most western European countries, US, and also Japan, Korea, India and China. Also in Denmark, we have seen the emergence of a national industry lead research and innovation initiative on manufacturing: "Manufacturing Academy of Demark (MADE)". What these programs share is the strong focus on IT and automation as an enabler of increased competitiveness. At Aalborg University, we have embrace the change and formed an inter-disciplinary research unit supporting this research agenda, and we have framed the Danish approach as Smart Production enabled by digitalization, automation and new collaborative business models.

Smart Production and Industry 4.0 provide a wealth of new research challenges and opportunities. This talk will present and clarify the concepts, identify some significant areas where business informatics research potentially may contribute with relevant new insights.

Contents