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Volume 9

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Thomas Knothe · Raúl Poler
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Enterprise Interoperability VIII

Smart Services and Business Impact of Enterprise Interoperability

Springer

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Preface

Industry 4.0, Internet of things, block-chain technologies and digital transformation require a foundation for seamless, clear and secure communication called "interoperability". Moreover, the cooperation between different organizations such as manufacturers, service providers and government requires "enterprise interoperability" between applications and systems. Consequently, interoperability of organizations is a major issue in successfully building enterprise networks. Interoperability becomes a key factor when smart services inside organizations and autonomous factories have to cooperate. Self-organizing production networks will have an enormous impact upon companies and their networks and require new business models for modelling, testing, executing and managing smart service infrastructures. Interoperability permeates all aspects of a business, from strategic and tactical planning to operational processes of the company and horizontally in the many facets of business cooperation. Accordingly, I-ESA'18 (Interoperability for Enterprise Systems and Applications) joins new business models, smart services, IoT and cloud technologies. Connecting the world's leading researchers and practitioners of enterprise interoperability and related domains, including interoperability aspects of enterprise systems and applications, I-ESA'18 presents an outstanding opportunity to exchange experiences and business ideas between researchers, service providers, entrepreneurs and industrial stakeholders.

I-ESA'18 is the ninth of a series of conferences: Genève (2005), Bordeaux (2006), Madeira (2007), Berlin (2008), Coventry (2010), Valencia (2012), Albi (2014), Guimarães (2016) and a special edition in Beijing (2009), this time under the motto "Smart Services and Business Impact of Enterprise Interoperability". The I-ESA'18 conference was hosted by Fraunhofer IPK and jointly promoted by DFI (Deutsches Forum für Interoperabilität e.V.) and INTEROP-VLab (European Virtual Laboratory for Enterprise Interoperability—http://www.interop-vlab.eu).

World-leading researchers and practitioners in the area of enterprise interoperability contributed to this book. You will find integrated approaches from different disciplines: Computer Science, Engineering and Business Administration.

The I-ESA'18 program included several keynotes presented by high-level renowned experts from industry, government and academia:

- Prof. Dr.-Ing. Dieter Wegener, Siemens AG, Vice President, Germany
- Dr. Nenad Ivezic, Systems Integration Division, Engineering Laboratory, National Institute of Standards and Technology (NIST), USA
- Mr. Gerald Santucci, European Commission (retired 2017), Ambassador of the INTEROP-VLab, Belgium
- Mr. Stefan Zimmerman, Head of COE Industrie 4.0 at Atos Global B&PS, Germany.

This book is organized into twelve parts addressing the major research in the scope of Interoperability for enterprise systems and applications:

Part I Security
Part II I 4.0 and Industrial Automation
Part III Platforms and Infrastructures for Enterprise Interoperability
Part IV Semantic Interoperability
Part V Interoperability Testing
Part VI Ontology Modeling
Part VII Block Chain and Decentralized Approaches
Part VIII Interoperability Application Scenarios
Part IX Interoperability in Manufacturing and Repair and Operation (MRO)
Part X Modelling and Frameworks
Part XI Entities in IoT
Part XII Interoperability in M2M Interaction.

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Bremen, Germany — Klaus-Dieter Thoben
Berlin, Germany — Thomas Knothe
Alcoy, Spain — Raúl Poler

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About the Editors

Keith Popplewell started his career in operational research and specialised in computer-aided engineering and production planning systems design with Raleigh Industries and Boots Company plc. During this time, he took a doctorate in production engineering and production management at the University of Nottingham. Subsequently, he became technical director in a software house specialising in the design, development and implementation of CAE systems, before joining the Department of Manufacturing Engineering at Loughborough University in 1985.

In 2000, he became Jaguar Cars Professor of Engineering Manufacture and Management and Head of Department at Coventry University, before, in 2006, he accepted the post of Director of Coventry University's Future Manufacturing Applied Research Centre (FMARC). His research interests centre on design, modelling and operation of global and network manufacturing enterprises, and in particular on providing intelligent knowledge oriented support for virtual organisations, especially focusing on the needs of SMEs. In this context, he is President of the INTEROP-VLab AISBL.

Klaus-Dieter Thoben is Professor for Integrated Product Development in the Faculty of Production Engineering at the University of Bremen, Germany. At the same time, he is Director of BIBA (Bremen Institute of Production and Logistics) and Spokesman of LogDynamics (Bremen Research Cluster of Dynamics in Logistics).

His main research activities include but are not limited to the application of information and communication technologies to support cooperative processes and environments with a specific focus on product development (smart/intelligent products engineering), product and systems lifecycle management, collaborative process chains, and enterprise networks. He has more than 25 years of experience in coordination and management of European and national funded research projects including EU-funded Networks of Excellence and large integrated projects (IPs). He has published some 500 research papers in national as well as international conferences and journals.

He is active on various levels and with different roles in various scientific as well as professional communities such as DFI e.V. (Deutsches Forum für Interoperabilität),

IFIP (International Federation of Information Processing) TC 5 Working Groups, WiGeP (Wissenschaftliche Gesellschaft für Produktentwicklung), ForWind, and VDI (Verein Deutscher Ingenieure).

Prof. Dr.-Ing. Thomas Knothe is Head of the Department of Business Process and Factory Management at Fraunhofer IPK, Corporate Management Division, and is responsible for the appliance methodology of the Enterprise Modelling Tool MO^2GO.

After finishing his study in information technology for production, he started his career at Fraunhofer IPK in 1998. He is lecturing at several universities in Germany and abroad, and since 2017, he holds an honorary Professorship at University of Applied Science in Wildau.

He coordinates several national and international research projects according to Industry 4.0 in Germany. His industrial background comes from leading various business and process development projects in IT service, aerospace, automotive and process industry. He holds several inventions in intelligent manufacturing, e.g. self-organized planning and control for maintenance repair and overhaul of transportation systems like aircraft.

He is Chairman of the German Association for Interoperability (DFI e.V.) and as Member of ISO involved into International Standardization regarding information processing for production.

Raúl Poler is Professor in Operations Management and Operations Research at the Universitat Politècnica de València (UPV), València, Spain. He received his Ph.D. in Industrial Engineering from UPV in 1998.

He is Director of the Research Centre on Production Management and Engineering (CIGIP). He is Founding Partner of the Spin-off UPV EXOS Solutions S.L. He is Director of the Master in Industrial Engineering and Logistics (MUIOL) at Alcoy Campus UPV.

He has led several Spanish Government and European R&D Projects. He has published more than 300 research papers in a number of leading journals and in several international conferences.

He is Member of the Board of Director of the INTEROP-VLab and Chair of its Education Committee. He is Secretary of INTERVAL. He is Member of the Executive Board of the Association for the Development of Organization Engineering (ADINGOR). He is Chair of the Education Activity of the IFIP WG 5.8 Enterprise Interoperability.