Introduction to the Special Issue on Smart Service Engineering

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Keywords. Enterprise Modelling • Smart Services • Digital Transformation

At present, the importance of services is increasing significantly in times of modernization and digitization of production systems. While the challenges of "Industry 4.0", the "Industrial Internet of Things", cyber-physical systems and smart factories are progressively being discussed at the product level, the question of how far services can be developed on the basis of a broad information base can also be specifically raised at the service level. The resulting approaches are also subsumed under the term "Smart Services", with "Smart" usually being used for context-sensitive services tailored to the needs of the customer. The emerging field in service research is characterized in particular by the fact that IT is no longer understood as a pure "transformer" of digital services, but much more as an "enabler" of completely new approaches. In order to explore these approaches, it is important to examine to what extent today's services and existing methods of service engineering for tomorrow's smart services can be revolutionized. Service modeling can clarify interfaces between innovative technologies and new, individual business models and thus provide a valuable basis for discussion.

Due to the outlined paradigm shift to Smart Services, we decided to combine the orientation of this year's EMISA Special Issue closer with the thematic focus of the papers. Under the title "Smart Service Engineering", together with the authors, we tackle the challenge of working out concepts and application scenarios for the digital transformation of services. Almost traditionally, this year's issue gives an overview of the state-of-the-art at the moment and presents current research problems, as well as possible solutions and future trends. While the first two papers focus on the fundamentals of service development, the latter three develop basics for the creation of smart services and for tangible application examples and scenarios.

All articles in this EMISA special issue were handed in by the authors in the course of the workshop "Service Modelling 2016" (DLM 2016, in German: Dienstleistungsmodellierung), examined by the program committee and finally chosen for conference presentation, as well as for publication.[1] The workshop itself took place on March 2, 2016 at the Karlsruhe Institute of Technology, Germany, as part of the conference "Modelling 2016".[2]

Due to the high number of interesting and high-quality submissions, we applied a two-step acceptance process for the articles. First: Acceptance as a scientific article. Complete scientific articles were published in the German workshop proceedings "Thomas, O.; Nüttgens, M.; Fellmann, M. (eds.), Smart Service Engineering – Konzepte und Anwendungsszenarien für die digitale Transformation, Wiesbaden, Springer". Second: Acceptance as a scientific article with an additional recommendation for journal publication. As a result, the

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[1] For more information on the workshop DLM 2016, cf. http://www.imwi.uni-osnabrueck.de/dlm2016.html
[2] cf. http://www.modellierung2016.org

five best articles of "Service Modelling 2016" – with an acceptance rate of less than 20% – were selected to be published in an extended form in this special issue of the EMISA journal on service systems and applications. The following is a brief synopsis of the contributions to this special issue:

The paper "A Classification Framework for Service Modularization Methods" by Jens Poeppelbuss and Aleksander Lubarski discusses the much-debated topic of service modularization and presents a regulatory framework for systematization. This way, current efforts in service modularization are summarized and categorized.

The paper "Managing the Procurement Process in Service Portals: An automated matching Approach with Demand Side Management Methods" by Dennis Behrens, Carola Gerwig, Thorsten Schoormann and Ralf Knackstedt examines the transferability of methodological approaches to demand-side management in service portals.

The paper "Product-Service-Systems: What and Why Developers Can Learn from Mass Customization" by Paul Christoph Gembarski and Roland Lachmayer deals with the issue of mass customization and compares business models and development environments for product service systems.

The paper "Modelling of a Smart Service for Consumables Replenishment: A Life Cycle Perspective" by Jürgen Anke, Stefan Wellsandt and Klaus-Dieter Thoben presents an approach to modelling the life cycles of Smart Services for connected products, demonstrated by a fictional example of a replenishment service for 3D printers.

The paper "The Next Generation – Design and Implementation of a Smart Glasses-Based Modelling System" by Dirk Metzger, Christina Niemöller, Sven Jannaber, Lisa Berkemeier, Lukas Brenning and Oliver Thomas shows the concept of a smart-glasses-based system for runtime modelling of service processes, to be used by service technicians.

We wish our readers many exciting moments in discovering the various facets of service systems modelling and gaining new insights.

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