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Michael Abramovici and Rainer Stark (Eds.)

Smart Product Engineering

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Preface

Dramatic progress in the fields of embedded microdevices, mobile communication, software and computing power have not only changed our daily life but will rapidly reshape industrial products, engineering processes and organizational structures. “Industry 4.0”, “Cyber-Physical Systems”, “Ubiquitous Computing” and “Internet of Things” are only a few examples of buzzwords trying to reflect these revolutionary changes which will lead to a convergence of the real physical world and the permanently growing digital world.

Smart Product Engineering – the topic of this conference – attempts to address these tremendous changes of both industrial products and engineering processes. In the context of product creation “smart” is not only a new fashionable word but refers to the following meanings: “clever“, “intelligent“, “ingenious“ and “agile“. **Smart products** are a new generation of products equipped with micro-sensors, computing power and mobile communication capabilities i.e. smartphones. However, not only consumer goods but also industrial products can become “smart” if embedded intelligence is applied. Then they are able to react instantly to environmental changes and to communicate with IT infrastructures or with other products. **Smart Product Engineering** describes processes, methods and tools for the creation of these smart products. Engineering processes could also exploit the newest IT developments in order to reduce and better integrate the increasing task complexity. In the last five years, a wave of research initiatives, start-up companies and marketing campaigns have addressed the new “smart” topic.

These “smart” developments offer huge opportunities to enhance task efficiency and to create more sustainable products. In order to exploit these opportunities it is necessary to provide new, highly interdisciplinary methods, organization concepts and IT tools. The papers included in this book give an overview of the main research activities and the industrial practice towards Smart Product Engineering.

The 23rd CIRP Design Conference continues a long tradition of prestigious design conferences organized under the aegis of the International Academy for Production Engineering (CIRP). The conference was jointly organized by Ruhr-

Universität Bochum (RUB) and by Technische Universität Berlin (TU Berlin). For over 40 years, both organizing universities have been worldwide pioneers in the development of product design methods and tools. The conference was organized in cooperation with the German Academic Society for Product Development - WiGeP.

Over 160 proposals were submitted for the conference. The international scientific program committee selected 98 academic and industrial papers from over 20 countries for presentation during the conference and for publication in these proceedings.

We would like to express our gratitude to all paper authors, keynote speakers, session's chairs and all participants for their contribution to the success of the conference. Our grateful thanks also go to all supporting industrial partners who made this conference possible. We also thank the conference organizing committee, especially the chief organizers Mr. Akamitl Quezada (RUB) and Mr. Maik Auricht (TU Berlin). Finally, we thank the publisher as well as the typesetting team for their support throughout the publication process.

We hope that the content of this book will offer useful and valuable input for research, teaching and industry.

Bochum and Berlin, January 2013

Michael Abramovici (RUB)

Rainer Stark (TU Berlin)

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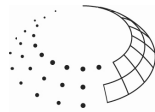
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