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IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.

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Ramy Harik · Louis Rivest
Alain Bernard · Benoit Eynard
Abdelaziz Bouras (Eds.)

Product Lifecycle Management for Digital Transformation of Industries

13th IFIP WG 5.1 International Conference, PLM 2016
Columbia, SC, USA, July 11–13, 2016
Revised Selected Papers

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Preface

In the wake of the fourth Industrial Revolution, commonly known as Industry 4.0, the need for optimization and automation-enabling tools and methodologies is growing steadily. PLM continues to merge together parallel and discontinued aspects of product ideation, design, manufacturing, support, recycling, and many other trades. This is facilitating industry cross-integration, reducing costs and increasing sustainability in complex environments empowering product lifecycle management for digital transformation of industries. The ability to neutralize product data and embed viewpoint integration is not new and has been researched since the explosion of CAD/CAM tools. This is what makes PLM particularly current and sets it as a need, especially for the next few decades where cyber-physical systems and cross-functional processes will only surge.

The IFIP International Conference on Product Lifecycle Management (www.plmconference.org) started in 2003 and since then it has been held yearly around the world and has facilitated the exchange and discussion of the most up-to-date information on product lifecycle management among professionals from academia and industry. This is the official conference of the IFIP Working Group WG 5.1 “Global product development for the whole lifecycle” (www.ifip-wg51.org), and IFIP PLM 2016 was held in Columbia, South Carolina, USA, during July 10–13, 2016.

Product lifecycle management, also known as PLM, is an integrated business approach to the collaborative creation, management, and dissemination of engineering data throughout the extended enterprises that create, manufacture, and operate engineered products and systems.

IFIP PLM 2016 marked the 13th anniversary of the conference, which continues its progress at an excellent rate both in terms of quality and quantity. The topics covered in the program include digital transformation of industries, big data analytics, building information modeling (BIM), cloud computing and mobile PLM, collaborative development architectures, cyber-physical systems (CPS), Industry 4.0, interoperability and systems integration, knowledge sharing, re-use and preservation, lean product development, lifecycle assessment and sustainability, metrics, standards and regulation, PLM and innovation, social networks impact, supply chain and value chain integration, traceability and performance.

One of the objectives of the conference is to provide a platform for experts to discuss and share their success in applying advanced concepts in their respective fields. The IFIP PLM 2016 conference included an outstanding technical program, with distinguished keynote speeches on current development and future visions from Karthik Ramani (Purdue University), Edward Griffor (NIST), Priyanka Gandhi (Amazon Web Services), Jiani Zhang (IBM Watson Internet of Things), Jim Doxey (Dropbox), Alain Bernard (Ecole Centrale Nantes), as well as an insightful tour of the premium McNAIR Laboratories. The conference also offered a great opportunity to young and aspiring researchers to present their research proposals and on-going work

during a dedicated PhD Workshop on the preconference day. This regular workshop is designed to support students in their networking activities and help them build their future community.

This book, organized in 14 chapters, is composed of selected enhanced papers presented at the IFIP PLM 2016 conference. It is part of the *IFIP Advances in Information and Communication Technology* (AICT) series that publishes state-of-the-art results in the sciences and technologies of information and communication. In addition to this conference, the *International Journal of Product Lifecycle Management* (IJPLM) is the official journal of the WG5.1 (www.inderscience.com/ijplm).

On behalf of the conference, we thank all the authors, sessions chairs, reviewers, and keynote speakers for their help and support in achieving a great conference. Our gratitude goes to the University of South Carolina, The McNAIR Center for Aerospace Innovation and Research, The College of Engineering and Computing at USC, The Office of Economic Engagement at the University of South Carolina, the Department of Mechanical Engineering at USC, and our sponsors Dassault Systemes, Ingersoll Machine Tools, HAAS, and Ingersoll Cutting tools.

We hope this book serves as a step forward in this exciting area of PLM and we look forward to meeting you at the next PLM conference in Seville, Spain, during July 9–12, 2017 (www.plm-conference.org).

February 2017

Ramy Harik

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