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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.

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Clement Fortin · Louis Rivest ·
Alain Bernard · Abdelaziz Bouras (Eds.)

Product Lifecycle Management in the Digital Twin Era

16th IFIP WG 5.1 International Conference, PLM 2019
Moscow, Russia, July 8–12, 2019
Revised Selected Papers

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Preface

Since 2003, the IFIP WG 5.1 PLM International Conference has brought together researchers, developers, and users of Product Lifecycle Management (PLM), an ICT and integrated business approach to the collaborative creation, management, and dissemination of engineering data throughout extended enterprises that create, manufacture, and operate engineered products and systems.

The PLM conference is the official conference for the IFIP WG 5.1. The conference aims at involving all stakeholders in the broad concept of PLM, hoping to shape the future of this field and advance the science and practice of the extended enterprise.

Issues of design methodologies across the whole product lifecycle, their supporting digital tools including the implementation of digital-twins, and integration challenges in the context of cyber-physical systems were key topics covered at the conference. The organizer of the PLM 2019 conference was the Skolkovo Institute of Science and Technology (Skoltech). The conference, which was held during July 10–12, 2019, included keynote lectures, scientific paper presentations, and industry-oriented sessions, with an extensive social program. The conference was preceded by a Doctoral workshop which took place during July 8–9, 2019.

Skoltech hosted the conference in Moscow, Russia, which offers many touristic attractions and a very rich cultural program all year round. Moscow also supports an important part of Russian industry, playing a key role in aerospace, software development, and manufacturing. Moreover, Moscow is a very important Russian center of research in many scientific areas and leads the educational transformation for the whole country in a number of strategic areas.

All submitted papers were reviewed by at least two reviewers following the single blind review process with at least 2 reviewers for each paper; 63 submissions were received in total, 22 were evaluated with minor corrections and 16 with major revisions that were reviewed before final publication. The Proceedings include 38 reviewed papers that will be indexed in Scopus and are grouped into 8 topical sections representing the current research state of the art in the field. They are namely:

1. 3D Modeling and Data Structures
2. PLM Maturity and Industry 4.0
3. Ontologies and Semantics
4. PLM and Conceptual Design
5. Knowledge and Change Management
6. IoT and PLM
7. Integrating Manufacturing Realities
8. Integration of In-service and Operation

The technical conference started with a high-level keynote talk by Dr. Thierry Chevalier from Airbus, France; his talk titled “Are PLM software soon to be dinosaurs?” challenged all participants about the evolution of the PLM technologies in this

Digital Twin era. His talk was followed by a keynote panel moderated by Prof. Lionel Roucoules from ParisTech, France, on the topic: “PLM ontologies, knowledge management and artificial intelligence.” This high-level panel session was followed by parallel technical sessions for the rest of the day.

The second day of the conference was reserved for industrial talks on PLM implementations from various viewpoints by top experts from the Russian Industry. Three keynotes and an industrial panel were presented, followed by a presentation by the Skolkovo Innovation Center and a pitch session for technological start-ups supported by the Skolkovo Innovation Centre. The program of the day was concluded by a tour of the Skolkovo Technopark facilities and a gala dinner cruise on the Moscow River.

The PLM 2019 conference was concluded by a third day of technical sessions, which were presented in the morning, and a private tour of the Starcity, the astronauts training center in the suburb of Moscow, which was very much appreciated by all participants.

These proceedings are the result of many important contributions at all levels as presented in the organization description below. We sincerely thank all those listed below and also those who are not included but were instrumental in making this PLM 2019 conference a great success.

December 2019

Clement Fortin
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