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IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

> IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

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 small and 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.

Any national society whose primary activity is about information processing may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

George L. Kovács Detlef Kochan (Eds.)

Digital Product and Process Development Systems

IFIP TC 5 International Conference, NEW PROLAMAT 2013
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Proceedings

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Preface

The triennial PROLAMAT conferences focus on computer applications in manufacturing and already have a respectable history. The first conference was in Rome, Italy in 1969 and the last one in Shanghai, China, in 2006. They addressed the issue of programming languages for machine tools, and created the acronym PROLAMAT. While the acronym has not changed, the topic has shifted considerably, due to the fast paradigm changes in the past years. The last conferences have addressed advances in CAM, software for discrete manufacturing, human aspects of CIM and globalization and virtual enterprises; etc. Finally TC5 of IFIP, which has traditionally been the main organizer of PROLAMAT, as flagship conference of TC5, however most WGs organize their regular meetings as well, decided to change the name a little and agreed to use the name NEW PROLAMAT to show and emphasize the changes and the continuity at the same time. It was already defined for the Shanghai PROLAMAT that it should cover all possible aspects of computerized design and production and operation of products and production systems from old style traditional to sophisticated great real ones through virtual and mixed ones. Today we can add that all aspects are taken into account during the total life span of the product and production system life-cycle of real, virtual or mixed products as well. As there are distinctions between systems and virtual and extended systems in the production level, we make distinctions between simple and extended products and between tangible and intangible features of products. In our recent sense everything can be understood as a product, including a production system, a car or any part of a clock, a leaflet, a service station or an advertisement, etc.

In order to demonstrate this new orientation towards IT-Innovations the label PROLAMAT is now interpreted as "Project Research On Leading-edge Applications and Methods for Applied Information Technology", closely related to industrial process chains. Knowledge, knowledge acquisition, management, distribution and applications are main issues of all up-to-date tools and means, which are taken into account in the research and applications of computers and networks for manufacturing automation and robotics are included in the topics of New PROLAMAT.

One of the best attended PROLAMAT conferences took place in 1988 in the city of Dresden, well known as a center of mechanical engineering, mechatronics, and computer sciences. It is an honor for the organizers to welcome again the PROLAMAT conference participants to the NEW PROLAMAT 2013 in Dresden.

The effective mastering and further developments of industrial process chains require continuous improvements by means of product and process innovations.

The scope of the NEW PROLAMAT covers engineering decision making and automated process realization, which are closely related to powerful and

sophisticated software support. At the beginning of the development of computer application for automated manufacturing, tasks as major pioneer work were realized mostly by university or academic research institutions together with large industrial companies.

Nowadays the situation has totally changed. Over the last decades an industry for software and manufacturing automation has established itself in the market. This actual situation will be taken into consideration at the NEW PROLAMAT 2013.

Because of the entire dynamic development in all engineering and research-fields, knowledge and experience exchange related to highly developed software is of utmost importance.

International competition requires innovations along the entire process chain. Product development, design and manufacturing of high-quality products has to be constantly improved in order to allow for realization in shortest times at reasonable costs as well as reduced energy and resources consumption.

The essential applications are realized in the automotive and aerospace industry; machine and plant engineering; consumer goods and others.

The automotive industry in Germany and throughout Europe is noticed to be the pathfinder in designing and implementing innovative and integrated process chains. This particular market constantly sets new standards and represents the reference points for both established and cutting-edge technology. Under the general framework of complete PLM strategies some of the most essential working fields will be focused on at the NEW PROLAMAT 2013

This book contains about 40 peer reviewed and carefully selected papers, which were presented at the meeting and were sent to the volume editors in due time. The authors represent several European and some overseas countries, and industry and academia, SMEs and multinational firms both sent their experts to distribute their knowledge and opinion, and to discuss differences and suggested ways to go.

The main topics of the papers are:

- Introduction, industrial challenges
- Digital Product- and Process Development
- Challenges for Digital Product and Process Design Systems
- IT support for Product and Process Development and Future Perspective
- Additive Manufacturing – Fast Prototyping
- Quality Management
- Standardization and Knowledge Development - Knowledge Management
- Modeling and Simulation of Procedures and Processes
- Industrial success stories, case studies,

On behalf of the International Program Committee and of the National Organizing Committee we express our gratitude to everybody, who assisted in preparing and running such an excellent international conference in Dresden. We underline only a few of them: IFIP TC5 people, who supported our efforts, people, who

assisted in local management, or in editing the papers (most editing was done by Adam Kisari of SZTAKI), and finally editors of Springer Publishers, who prepared this beautiful book.

August 2013

Detlef Kochan
George Kovács

Organization

Organized and sponsored by

IFIP (International Federation of Information Processing)

Netzwerk Automobilzulieferer Sachsen (AMZ)
AMZ is for 13 years now the central network of the automotive industry, its suppliers and companies in research, development and engineering in Saxony. The central idea of the AMZ network is to initiate and support product and technology development for sustainable growth of Saxon companies in the automotive supply industry.

Main focus of AMZ are powertrain, body in white, interior, vehicle safety and future technologies like electric and hydrogen power.

Different research groups and innovative events of the AMZ network such as NEW PROLAMAT are focused in the individual support of Saxon automobile supplying companies, for example ergonomic work place, process management, financing the growths and insurance, innovative human management as well as training and education.

The network AMZ is managed by the "RKW Sachsen GmbH Service and Consulting" that offers individual service and professional development for economic enterprises and public establishments. RKW is partner of the nationwide network of RKW Association in Germany.

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