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*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.

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Shigeki Umeda · Masaru Nakano  
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# Advances in Production Management Systems

## Innovative Production Management Towards Sustainable Growth

IFIP WG 5.7 International Conference, APMS 2015  
Tokyo, Japan, September 7–9, 2015  
Proceedings, Part I

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# Preface

Modern companies in industrially advanced countries face the low growth of the global economy. Every enterprise makes various efforts to survive in such a severe management environment. Mass production style has disappeared, and manufacturers must provide goods that the customer favors when the customer wants them.

Organizations today cannot do it alone. Most modern enterprises depend on the collective efforts of a group of trading partners to stretch a supply chain from the raw material supplier to the end customer. A trading partner in this context means any external organization that plays an integral role in the enterprise and whose business fortune depends wholly or partly on the success of the enterprise. This includes factories, contract manufacturers, sub-assembly plants, distribution centers, wholesalers, retailers, carriers, freight forwarder services, customer broker services, international procurement organizations, and value-added network services. Building such resilient global value-chains is needed.

Current enterprises also face global environment issues. Saving energy, reduction of industrial waste, and reutilization of natural resources are required in all operational stages to realize environmentally friendly production and logistics systems. Modern manufacturing enterprises should cope well with such issues as enterprise management responsibilities.

This book collects suggestions of leading researchers and practitioners from all around the world, including conceptual frameworks of new approaches, developments of novel technologies, and case studies of practical issues. The book comprises five main categories, including specific subtopic themes as follows:

- Collaborative networks
  - Collaborative tools in production management
  - Collaborative design
  - Distributed systems and multi-agent technologies
  - ICT for collaborative manufacturing
  - Innovation for enterprise collaboration
  - Collaborative information networks
  - Performance measurement and benchmarking
  - B2B, B2C
- Globalization and production management
  - Inventory management in large supply chains
  - Global supply chain systems
  - Mass customization
  - Social and cultural aspects of global supply chains

- Worldwide procurement
- Logistics and distribution management
- Knowledge-based production management
  - Computational intelligence in production management
  - Intelligent manufacturing systems
  - Knowledge engineering
  - Knowledge-based PLM
  - Production planning and control
  - Scheduling
  - Automatic learning systems
  - Modeling and simulation of business and operational processes
  - Supply chain simulation
  - Social networks for manufacturing
  - Virtual factory
  - Agile and flexible manufacturing systems
- Project management, engineering management, and quality management
  - Closed loop design
  - Highly customized products and services
  - Quality management
  - QFD
  - Six-sigma
  - New products development
  - Engineering management
  - Engineering and management education
- Sustainability and production management
  - Eco-design and eco-innovation
  - Energy efficiency in manufacturing
  - Green manufacturing
  - Life cycle assessment
  - Remanufacturing
  - Disassembly and recycling
  - Sustainable supply chains
  - Sustainability in global supply networks
  - Smart factory

The papers in this book were peer reviewed and presented at the advanced production management systems conference – APMS 2015 – which was held in Tokyo, Japan, September 7–9, 2015. The conference was supported by Working Group 7 of Technical Committee 5 of the International Federation for Information Processing called Advances in Production Management Systems (APMS) and was hosted by Musashi University, Tokyo, Japan.

There were 185 full paper submissions, and 163 of them were accepted through peer review. Thus, the acceptance ratio is about 88 %. As the book editors, we would like to thank all the contributors for the high-quality presentation of their papers. We would also like to thank the members of the international Program Committee for their work in reviewing and selecting the papers.

June 2015

Shigeki Umeda  
Masaru Nakano  
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