Contents

Smart Products

Information and Data Provision of Operational Data for the Improvement of Product Development ...................................................... 3
   Klaus-Dieter Thoben and Marco Lewandowski

Integrated Component Data Model Based on UML for Smart Components
   Luiz Fernando C.S. Durão, Helge Eichhorn, Reiner Anderl,
   Klaus Schützer, and Eduardo de Senzi Zancul

Foot Plantar Pressure Estimation Using Artificial Neural Networks .......... 23
   Elias Xidias, Zoi Koutkalaki, Panagiotis Papagiannis,
   Paraskevas Papanikos, and Philip Azariadis

PLM System Support for Collaborative Development of Wearable
   Meta-Products Using SBCE ............................................................. 33
   Mohammed Taha Elhariri Essamlali, Aicha Sekhari,
   and Abdelaziz Bouras

Assessment Approaches

Publish and Subscribe Pattern for Designing Demand Driven Supply
   Networks ....................................................................................... 45
   David R. Gnimpieba Zanfack, Ahmed Nait-Sidi-Moh, David Durand,
   and Jérôme Fortin

An Environmental Burden Shifting Approach to Re-evaluate the
   Environmental Impacts of Products ................................................ 56
   Xi Yu, Antoine Nongaillard, Aicha Sekhari, and Abdelaziz Bouras

Risk Probability Assessment Model Based on PLM’s Perspective Using
   Modified Markov Process ................................................................. 66
   Siravat Teerasaponpong and Apichat Sopadang

How Additive Manufacturing Improves Product Lifecycle Management
   and Supply Chain Management in the Aviation Sector? ....................... 74
   Alejandro Romero and Darli Rodrigues Vieira
PLM Maturity

Different Approaches of the PLM Maturity Concept and Their Use
Domains – Analysis of the State of the Art ............................................. 89
Hannu Kärkkäinen and Anneli Silventoinen

CLIMB Model: Toward a Maturity Assessment Model for Product Development .......................................................... 103
Monica Rossi and Sergio Terzi

A Maturity Model to Promote the Performance of Collaborative Business Processes ...................................................... 112
Maroua Hachicha, Néjib Moalla, Muhammad Fahad, and Yacine Ouzrout

A Process Based Methodology to Evaluate the Use of PLM Tools in the Product Design ...................................................... 125
Angelo Corallo, Mariangela Lazoi, and Antonio Margarito

Building Information Modeling (BIM)

Procedural Approach for 3D Modeling of City Buildings ......................... 137
Wenhua Zhu, Dexiong Wang, Benoit Eynard, Matthieu Bricogne, and Sebastien Remy

Potential Improvement of Building Information Modeling (BIM) Implementation in Malaysian Construction Projects ..................... 149
Aryani Ahmad Latiffi, Suzila Mohd, and Umol Syamsyul Rakiman

Investigating the Potential of Delivering Employer Information Requirements in BIM Enabled Construction Projects in Qatar .................. 159
Mian Atif Hafeez, Racha Chahrour, Vladimir Vukovic, Nashwan Dawood, and Mohamad Kassem

Roles and Responsibilities of Construction Players in Projects Using Building Information Modeling (BIM) ...................................... 173
Aryani Ahmad Latiffi, Juliana Brahim, and Mohamad Syazli Fathi

3D Capture Techniques for BIM Enabled LCM ...................................... 183
Fodil Fadli, Hichem Barki, Ahmed Shaat, Lamine Mahdjoubi, Pawel Boguslawski, and Vadim Zverovich

Comparing BIM in Construction with 3D Modeling in Shipbuilding Industries: Is the Grass Greener on the Other Side? ...................... 193
Ran Luming and Vishal Singh
Languages and Ontologies

Natural Language Processing of Requirements for Model-Based Product Design with ENOVIA/CATIA V6. ........................................ 205
   Romain Pinquié, Philippe Véron, Frédéric Segonds, and Nicolas Croué

Improving Enterprise Wide Search in Large Engineering Multinationals: A Linguistic Comparison of the Structures of Internet-Search and Enterprise-Search Queries ........................................ 216
   David Edward Jones, Yifan Xie, Chris McMahon, Marting Dotter, Nicolas Chanchevrier, and Ben Hicks

Customer Reviews Analysis Based on Information Extraction Approaches . . . 227
   Haiqing Zhang, Aicha Sekhari, Florendia Fourli-Kartsouni, Yacine Ouzrout, and Abdelaziz Bouras

Knowledge Sharing Using Ontology Graph-Based: Application in PLM and Bio-Imaging Contexts .................................................. 238
   Cong Cuong Pham, Alexandre Durupt, Nada Matta, and Benoit Eynard

Towards an Approach to Link Knowledge and Prediction in Product Design .................................................. 248
   Bertrand Marconnet, Frédéric Demoly, Davy Monticolo, and Samuel Gomes

A Framework to Capture and Share Knowledge Using Storytelling and Video Sharing in Global Product Development ................. 259
   Joseph P. Zammit, James Gao, and Richard Evans

Product Service Systems

Review of Product-Service System Design Methods ......................... 271
   Eugenia Marilungo, Margherita Peruzzini, and Michele Germani

From Selling Products to Providing User Oriented Product-Service Systems – Exploring Service Orientation in the German Machine and Plant Manufacturing Industry ........................................ 280
   Konstantin Kernschmidt, Stephanie Preißner, Christina Raasch, and Birgit Vogel-Heuser

Data-Driven Modelling: Towards Interpreting and Understanding Process Evolution of In-Service Engineering Projects ..................... 291
   Lei Shi, Linda Newnes, Steve Culley, James Gopsill, and Chris Sinder

Meta-Model of PLM for Design of Systems of Systems .................... 301
   Peter Hehenberger, Matthieu Bricogne, Julien Le Duigou, and Benoit Eynard
A Framework of Value Creation for Industrial Product-Service. ............. 311
  P.P. Wang, X.G. Ming, and M.K. Zheng

Servicization of Product Lifecycle Management: Towards Service Lifecycle
Management. ................................................................. 321
  Fabien Mahut, Matthieu Bricogne, Joanna Daaboul, and Benoît Eynard

**Future Factory**

Early Prototyping in the Digital Industry: A Management Framework ....... 335
  Julius Golovatchev and Steven Schepurek

Modelling the Evolution of Computer Aided Design Models: Investigating
the Potential for Supporting Engineering Project Management ......... 344
  James A. Gopsill, Chris Snider, Lei Shi, and Ben J. Hicks

Identification of Regularities in CAD Part and Assembly Models ........ 355
  L. Chiang, F. Giannini, and M. Monti

Proposition of a Conceptual Model for Knowledge Integration
and Management in Digital Factory. .................................. 366
  Marwa Bouzid, Mohamed Ayadi, Vincent Cheutet,
  and Mohamed Haddar

Identification of Factors During the Introduction and Implementation
of PLM Methods and Systems in an Industrial Context ............. 376
  Vahid Salehi and Chris McMahon

**Knowledge Creation and Management**

Capturing, Structuring, and Accessing Design Rationale Across Product
Design and FEA. .......................................................... 387
  Morteza Poorkiany, Joel Johansson, and Fredrik Elgh

Multi-scale Modelling for Knowledge Capitalization and Design
For Manufacturability ...................................................... 397
  Yóisbel Galavis-Acosta, Lionel Roucoules, and Lionel Martin

Manufacturability Assessment in the Conceptual Design of Aircraft
Engines – Building Knowledge and Balancing Trade-Offs ............. 407
  Roland Stolt, Samuel André, Fredrik Elgh, and Petter Andersson

Knowledge and Information Structuring in Reverse Engineering
of Mechanical Systems .................................................... 418
  Mohamed Islem Ouamer-Ali, Florent Laroche, Sébastien Remy,
  and Alain Bernard
Knowledge Management on Asset Management for End of Life Products . . . 428
N. Chakpitak, P. Loahavilai, K. Dahal, and A. Bouras

A Conceptual Model to Assess KM and Innovation Projects: A Need for an Unified Framework ................................. 444
Patrick Mbassegue, Florent Lado Nogning, and Mickaël Gardoni

Simulation and Virtual Environments

Towards 3D Visualization Metaphors for Better PLM Perception ........... 461
Frédéric Noël and Dov Dori

Simulation Data Management and Reuse: Toward a Verification and Validation Approach .................................................. 476
Anaïs Ottino, Thomas Vosgien, Julien Le Duigou, Nicolas Figay, Pascal Lardeur, and Benoît Eynard

Deeper Insights into Product Development Through Data Visualization Techniques .................................................. 485
Jens Michael Hopf and Jivka Ovtcharova

Evaluation of Methods to Identify Assembly Issues in Text .................. 495
N. Madhusudanan, B. Gurumoorthy, and Amaresh Chakrabarti

Virtual Validation of Automotive Measurement Services Based on JT (ISO 14306:2012) ................................................. 505
Andreas Faath, Alexander Christ, Reiner Anderl, and Frank Braunroth

Augmented Reality Simulation of CAM Spatial Tool Paths in Prismatic Milling Sequences ............................................ 516
Saša Ćuković, Goran Devedžić, Frieder Pankratz, Khalifa Baizid, Ionut Ghionea, and Andreja Kostić

Sustainability and Systems Improvement

Assessing Social Sustainability of Products: An Improved S-LCA Method . . . 529
Michele Germani, Fabio Gregori, Andrea Luzi, and Marco Mengarelli

High Impact Polypropylene Recycling – Mechanical Resistance and LCA Case Study with Improved Efficiency by Preliminary Sensitivity Analysis . . . 541
Michal Kozderka, Bertrand Rose, Vladimir Koči, Emmanuel Caillaud, and Nadia Bahlouli

Improving Manufacturing System’s Lifecycle: Proposal of a Closed Loop Framework .................................................. 554
Daniele Cerri and Sergio Terzi
Big Data Perspective with Otological Modeling for Long Term Traceability of Cultural Heritage. .......................................................... 562
Muhammad Naeem, Muhammad Fahad, Néjib Moalla, Yacine Ouzrout, and Abdelaziz Bouras

Performance Study for a Sustainable Strategy: Case of Electrical and Electronic Equipments Waste ............................................. 572
Soumaya Dhib, Sid-Ali Addouche, Abderrahman El Mhamdi, and Taicir Loukil

Configuration and Engineering Change

Case Study on Engineering Change Management and Digital Manufacturing ................................................................. 591
Simo-Pekka Leino, Lauri Jokinen, Juha-Pekka Anttila, and Antti Pulkkinen

Implementation of Systems Engineering Model into Product Lifecycle Management Platform .................................................. 601
Shuning Li, Hazim El-Mounayri, Weijie Zhang, Bill Schindel, and Jason Sherey

Reconfigurable Modularization and Customer Engagement: Looking for a New PLM in an Age of Diversification and Personalization ................................................................. 609
Shuichi Fukuda

Characterising the Industrial Context of Engineering Change Management ................................................................. 618
Antti Pulkkinen, Petri Huhtala, Simo-Pekka Leino, Juha-Pekka Anttila, and Ville V. Vainio

Education Studies

SaaS for Education: A Case Study of Google Apps in Software Engineering Class ................................................................. 631
Pradorn Sureephong and Apitchaka Singjai

PLM in a Didactic Environment: The Path to Smart Factory .................................................................................. 640
Julían Mora-Orozco, Álvaro Guarín-Grisales, Joel Sauza-Bedolla, Gianluca D’Antonio, and Paolo Chiabert

A Survey on Educational Ontologies and Their Development Cycle ............................................................................ 649
AbdelGhani Karkar, Jihad Mohamad Al Ja’am, and Sebti Foufou

How Notations Are Developed: A Proposed Notational Lifecycle .............................................................................. 659
T.R.G. Green and Noora Fetais
Scientometric Study of Product Lifecycle Management International Conferences: A Decade Overview ........................................ 672
Saurav Bhatt, Fen Hsuan Tseng, Nicolas Maranzana, and Frédéric Segonds

Cyberphysical and Smart Systems
Integration of Smart City and Lifecycle Concepts for Enhanced Large-Scale Event Management ......................................... 687
Ahmed Hefnawy, Abdelaziz Bouras, and Chantal Cherifi

PLM Framework for the Development and Management Smart Energy Products .......................................................... 698
Julius Golovatchev and Oliver Budde

Towards Virtual Confidence - Extended Product Lifecycle Management . . . . 708
Jan Oscarsson, Manfred A. Jeusfeld, and Anders Jenefeldt

How Product Development Can Be Improved in Fast Fashion Industry: An Italian Case .................................................. 718
Elisa d’Avolio, Romeo Bandinelli, and Rinaldo Rinaldi

System Driven Product Development (SDPD) by Means of Development of a Mechatronic Systems in an Industrial Context 729
Vahid Salehi and Lukas Burseg

Business Collaboration – An Approach Towards End-to-End ICT Solutions for Virtual Factory ........................................ 738
Ahm Shamsuzzoha and Petri Helo

Design and Integration Issues
Towards Co-designing with Users: A Mixed Reality Tool for Kansei Engineering .......................................................... 751
Pierre-Antoine Arrighi, Santosh Maurya, and Céline Mougenot

A Proposal of Manufacturing Execution System Integration in Design for Additive Manufacturing ................................ 761
Gianluca D’Antonio, Frédéric Segonds, Joel Sauza Bedolla, Paolo Chiabert, and Nabil Anwer

Master Data Management in PLM for the Enterprise Scope .................. 771
Sehyun Myung

PLM-MES Integration: A Case-Study in Automotive Manufacturing ........ 780
Gianluca D’Antonio, Joel Sauza Bedolla, Gianfranco Genta, Suela Ruffa, Giulio Barbato, Paolo Chiabert, and Giorgio Pasquettaz
Product Usage in Engineering Design ........................................ 790
  Xiaoguang Sun, Rémy Houssin, Jean Renaud, and Mickaël Gardoni

Introducing Design Descriptions on Different Levels of Concretisation in a Platform Definition ........................................ 800
  Samuel André, Roland Stolt, and Fredrik Elgh

PLM Processes and Applications

A Multiobjective Optimization Framework for the Embodiment Design of Mechatronic Products Based on Morphological and Design Structure Matrices ........................................ 813
  Didier Casner, Rémy Houssin, Jean Renaud, and Dominique Knittel

Information Quality in PLM: A Production Process Perspective .......... 826
  Thorsten Wuest, Stefan Wellsandt, and Klaus-Dieter Thoben

A Virtual Milling Machine Model to Generate Machine-Monitoring Data for Predictive Analytics ........................................ 835
  David Lechevalier, Seung-Jun Shin, Jungyub Woo, Sudarsan Rachuri, and Sebti Foufou

PLM Process and Information Mapping for Mass Customization Based on Additive Manufacturing ........................................ 846
  Eduardo de Senzi Zancul, Gabriel Delage e Silva, Luiz Fernando C.S. Durão, and Alexandre M. Rocha

Multidisciplinary Interface Modelling: A Case Study on the Design of 3D Measurement System ........................................ 856
  Chen Zheng, Julien Le Duigou, Matthieu Bricogne, Peter Hehenberger, and Benoît Eynard

A Follow-up Case Study of the Relation of PLM Architecture, Maturity and Business Processes ........................................ 867
  Ville V. Vainio and Antti Pulkkinen

Author Index ........................................ 875
Product Lifecycle Management in the Era of Internet of Things
12th IFIP WG 5.1 International Conference, PLM 2015, Doha, Qatar, October 19-21, 2015, Revised Selected Papers
Bouras, A.; Eynard, B.; Foufou, S.; Thoben, K.-D. (Eds.)
2016, XVIII, 877 p. 363 illus., Hardcover
ISBN: 978-3-319-33110-2