Contents

Part I  Interdisciplinary Approaches for Robustness in Manufacturing

How Do Production Systems in Biological Cells Maintain Their Function in Changing Environments? 3
Moritz Emanuel Beber and Marc-Thorsten Hütt

Order Related Acoustic Characterization of Production Data 17
Michael Iber and Katja Windt

Potentials of Nonlinear Dynamics Methods to Predict Customer Demands in Production Networks 33
Bernd Scholz-Reiter and Mirko Kück

The Structure of the Value Creation Network for the Production of Electric Vehicles 47
Richard Colmorn, Michael Hülsmann and Alexandra Brintrup

Network Configuration in Presence of Synchronization Requirements 63
Jörn Schönberger and Herbert Kopfer

Modeling Production Planning and Transient Clearing Functions 77
Dieter Armbruster, Jasper Fonteijn and Matt Wienke

Part II  Robust Manufacturing Control Methods

Switching Dispatching Rules with Gaussian Processes 91
Jens Heger, Torsten Hildebrandt and Bernd Scholz-Reiter
An AI Based Online Scheduling Controller for Highly Automated Production Systems .......................... 105
Emanuele Carpanzano, Amedeo Cesta, Fernando Marinò, Andrea Orlandini, Riccardo Rasconi and Anna Valente

Stochastic Scheduling of Machining Centers Production, Estimating the Makespan Distribution .................. 121
Tullio Tolio and Marcello Urgo

Coordination of Capacity Adjustment Modes in Work Systems with Autonomous WIP Regulation ........... 135
Neil Duffie, John Fenske and Madhu Vadali

Evaluating the Effects of Embedded Control Devices in Autonomous Logistic Processes .......................... 147
Steffen Sowade, Philipp von Lamezan and Bernd Scholz-Reiter

Robustness of Complex Adaptive Logistics Systems: Effects of Autonomously Controlled Heuristics in a Real-World Car Terminal ......................................................... 161
Christoph Illigen, Benjamin Korsmeier and Michael Hülsmann

A Pedestrian Dynamics Based Approach to Autonomous Movement Control of Automatic Guided Vehicles .................. 175
Maik Bähr, Reik V. Donner and Thomas Seidel

Using a Clustering Approach with Evolutionary Optimized Attribute Weights to Form Product Families for Production Leveling ................................................................. 189
Fabian Bohnen, Marco Stolpe, Jochen Deuse and Katharina Morik

Data Mining as Technique to Generate Planning Rules for Manufacturing Control in a Complex Production System .......................................................... 203
Christian Rainer

Striving for Zero Defect Production: Intelligent Manufacturing Control Through Data Mining in Continuous Rolling Mill Processes .................................................... 215
Benedikt Konrad, Daniel Lieber and Jochen Deuse
Part III Robustness in Manufacturing Networks and Adaptable Logistics Chains

Role and Novel Trends of Production Network Simulation .............. 233
Giacomo Liotta

On the Configuration and Planning of Dynamic Manufacturing Networks .................................. 247
Nikolaos Papakostas, Konstantinos Efthymiou, Konstantinos Georgoulis and George Chryssolouris

What Can Quality Management Methodology and Experience Contribute to Make Global Supply Networks More Robust? ............. 259
Werner Bergholz

Innovative Quality Strategies for Global Value-Added-Networks ....... 271
Gisela Lanza, Johannes Book, Kyle Kippenbrock and Anamika Saxena

From Collaborative Development to Manufacturing in Production Networks: The SmartNets Approach ...................... 287
Armin Lau, Manuel Hirsch and Heiko Mattheis

Service-Oriented Integration of Intercompany Coordination into the Tactical Production Planning Process ....................... 301
Christoph Besenfelder, Yilmaz Uygun and Sandra Kaczmarek

Description of a Configuration Model for Establishing Adaptable Logistics Chains ............................................. 315
Markus Florian, Henrik Gommel and Wilfried Sihn

Real-Time Logistics and Virtual Experiment Fields for Adaptive Supply Networks .................................. 327
Michael Toth and Klaus M. Liebler

New Mechanisms in Decentralized Electricity Trading to Stabilize the Grid System: A Study with Human Subject Experiments and Multi-Agent Simulation ...................... 341
Sho Hosokawa and Nariaki Nishino

Decentralized Manufacturing Systems Review: Challenges and Outlook ........................................... 355
Dimitris Mourtzis and Michalis Doukas
Environmental Impact of Centralised and Decentralised Production Networks in the Era of Personalisation ............................. 371
Dimitris Mourtzis, Michalis Doukas and Foivos Psarommatis

Innovative Approaches for Global Production Networks ................... 385
Günther Schuh, Till Potente, Daniel Kupke and Rawina Varandani

Part IV Process Optimization and Strategic Approaches Towards Robustness

Evaluation of Production Processes Using Hybrid Simulation ............ 401
Norbert Gronau, Hanna Theuer and Sander Lass

Robust Manufacturing Through Integrated Industrial Services: The Delivery Management .................................................. 415
Horst Meier and Thomas Dorka

Enhancements of a Logistic Model to Improve the Time Synchronicity of Convergent Supply Processes ................................. 429
Sebastian Beck, Friedrich Gehler and Peter Nyhuis

Self-Optimizing Decision-Making in Production Control ................. 443
Günther Schuh, Till Potente, Sascha Fuchs, Christina Thomas,
Stephan Schmitz, Carlo Hausberg, Annika Hauptvogel
and Felix Brambring

Robust Solution Approach to CLSP Problem with an Uncertain Demand ................................................................. 455
Wilhelm Dangelmaier and Ekaterina Kaganova

Evaluating Lead Time Standard Deviation with Regard to the Lead Time Syndrome ......................................................... 469
Mathias Knollmann and Katja Windt

An Integrated Approach: Combining Process Management,
Organizational Structure and Company Layout ............................. 481
Günther Schuh, Till Potente, Fabian Bachmann and Thomas Froitzheim

Design and Quality Control of Products Robust to Model Uncertainty and Disturbances .................................................. 495
Beata Mrugalska
Dynamic Business Model Analysis for Strategic Foresight in Production Networks .......................... 507
Hans-Christian Haag and Meike Tilebein

Dynamic Capabilities in Manufacturing Processes: A Knowledge-based Approach for the Development of Manufacturing Flexibilities ........................................... 519
Philip Cordes and Michael Hülsmann

Evaluation Model for Robustness and Efficiency Trade-offs in Production Capacity Decisions ........................................................ 535
Max Monauni, Mirja Meyer and Katja Windt

Index ................................................................. 549
Robust Manufacturing Control
Proceedings of the CIRP Sponsored Conference RoMaC
2012, Bremen, Germany, 18th-20th June 2012
Windt, K. (Ed.)
2013, XXX, 554 p., Hardcover
ISBN: 978-3-642-30748-5