

Preface



In this book, the results of the second phase of the Cluster of Excellence “Integrative Production Technology for High-Wage Countries” are summarized, addressing the question how to compete in high-wage countries successfully and sustainably in a changing economic, ecological and social environment. These changes underlie high dynamics that, for instance, result from varying customer needs, growing scarcity of raw materials and from demographic changes.

The integrative and interdisciplinary research approach of the Cluster of Excellence enables controlling and reacting to the related effects on production systems. The integration of production, material, natural and social scientists as well as of business economists allows combining expert knowledge for a holistic view of the interdependencies in complex socio-technical production systems across all production levels and value chain stages.

The defined research fields of the Cluster of Excellence—individualization, virtualization, integrated technologies and self-optimization—set the framework for integrative research and collaboration. The aims of the four technology-driven research fields are to be able to produce individualized products at mass production costs, virtually model methodologies and tools for assessing and predicting product properties and production systems, evaluate multi-technology platforms and products and to develop socio-technical production systems that are able to autonomously define and reach as well as maintain optimal operating points. The goal of the cross-sectional processes is to consolidate the technological research results towards sustainability in terms of scientific, personnel and structural development.

This book presents and summarizes the findings of the Cluster of Excellence during the second phase of funding in the Excellence Initiative framework. For more detailed results please refer to the corresponding scientific publications.

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We would like to dedicate this book to Prof. Dr.-Ing Christopher Schlick and Dr.-Ing. Drazen Veselovac, two excellent researchers of our cluster, who passed away far too early.

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Integrative Production Technology

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