Dynamic Manufacturing Solutions

Agility has become very important for the industries today as the lifetimes of the products are continuously shrinking. This book provides an excellent opportunity for updating understanding of agile methods from the design, manufacturing and business process perspectives, whether one is an industrial practitioner, academic researcher engineer or business graduate student. This volume is a compilation of various important aspects of agility consisting of systemic considerations in manufacturing, agile software systems, agile business systems, agile operations research, flexible manufacturing systems, advanced manufacturing systems with improved materials and mechanical behavior of products, agile aspects of design, clean and green manufacturing systems, environment, agile defence systems.

This book provides energy efficiency quantitative analysis and optimal methods for discrete manufacturing systems from the perspective of global optimization. In order to analyze and optimize energy efficiency for discrete manufacturing systems, it uses real-time access to energy consumption information and models of the energy consumption, and constructs an energy efficiency quantitative index system. Based on the rough set and analytic hierarchy process, it also proposes a principal component quantitative analysis and a combined energy efficiency quantitative analysis. In turn, the book addresses the design and development of quantitative analysis systems. To save energy consumption on the basis of energy efficiency analysis, it presents several optimal control strategies, including one for single-machine equipment, an integrated approach based on RWA-MOPSO, and one for production energy efficiency based on a teaching and learning optimal algorithm. Given its scope, the book offers a valuable guide for students, teachers, engineers and researchers in the field of discrete manufacturing systems.

From concept development to final production, this comprehensive text thoroughly examines the design, prototyping, and fabrication of engineering products and emphasizes modern developments in system modeling, analysis, and automatic control. This reference details various management strategies, design methodologies, traditional production techniques, and assembly applications for clear illustration of manufacturing engineering technology in the modern age. Considers a variety of methods for product design including axiomatic design, design for X, group technology, and the Taguchi method, as well as modern production techniques including laser-beam machining, microlithography.

Dear reader! In your hand you have the second book from the series "XXI Century Techno- gies. " The first book under the title "Manufacturing Technologies for Machines of the Future" was published by "Springer" in 2003. This book is aimed at solving one of the basic problems in the development of modern machine-building – working out of technologies and manufacturing equipment which would promote the continuous development and improvement of the final product design, rapidly "adaptable" to the requirements of the market as for the quantity, quality, and variety of products manufactured with the lowest cost and minimum time and labor of the product process. In this book the problems of theory and practice of development in the reconfigurable manufacturing systems and transformable factories for various machine-building branches with a focus on automotive industry are discussed. The problems concerning the development of a new class of production systems which in comparison to the flexible manufact- ing systems are composed of a far less quantity of machine-tools (reduced cost of production) are discussed. In comparison to the conventional automated lines (dedicated systems) they make it possible to rapidly transform the equipment for new products manufacturing. The book has some advantages concerning the art of scientific ideas and the

presentation of developments.

This book constitutes the proceedings of the 8th International Heinz Nixdorf Symposium, IHNS 2010, held in Paderborn, Germany, April 21-22, 2010, under the title "Changing Paradigms: Advanced Manufacturing and Sustainable Logistics". The 27 full and two short papers presented in this book were carefully reviewed and selected from a total of 63 submissions. They are grouped in five parts on Supply Chain Management, Production Logistics and Industrial Engineering, Operations Research Techniques, Humanitarian Logistics, and Simulation. The presentation is completed by nine invited keynote papers from renowned international experts in these fields.

"This book focuses on the latest innovations in the process of manufacturing in engineering"--Provided by publisher.

This book contains all refereed papers that were accepted to the fifth edition of the « Complex Systems Design & Management » (CSD&M 2014) international conference which took place in Paris (France) on the November 12-14, 2014. These proceedings cover the most recent trends in the emerging field of complex systems sciences & practices from an industrial and academic perspective, including the main industrial domains (aeronautic & aerospace, transportation & systems, defense & security, electronics & robotics, energy & environment, health & welfare services, software & e-services), scientific & technical topics (systems fundamentals, systems architecture & engineering, systems metrics & quality, systemic tools) and system types (transportation systems, embedded systems, software & information systems, systems of systems, artificial ecosystems). The CSD&M 2014 conference is organized under the guidance of the CESAMES non-profit organization, address: CESAMES, 8 rue de Hanovre, 75002 Paris, France.

In this book interrelated factor demand models are surveyed. New methods are developed and are analysed empirically using Dutch and U.K. time series data. New methods are discussed for obtaining closed form solutions of linear ratinal expectations models, providing deeper insights into the identification of structural parameters of underlying theoretical models; recently developed time series techniques are applied in order to estimate structural parameters and test for model specification, stationarity and stability through time; new models are developed in which the rather stringent and questionable restrictions of symmetry generally imposed upon stochastic adjustment models of labour demand are relaxed, the models are analysed empirically using time series data of Dutch and U.K. manufacturing production and nonproduction workers.

Decision support systems (DSS) are widely touted for their effectiveness in aiding decision making, particularly across a wide and diverse range of industries including healthcare, business, and engineering applications. The concepts, principles, and theories of enhanced decision making are essential points of research as well as the exact methods, tools, and technologies being implemented in these industries. From both a standpoint of DSS interfaces, namely the design and development of these technologies, along with the implementations, including experiences and utilization of these tools, one can get a better sense of how exactly DSS has changed the face of decision making and management in multi-industry applications. Furthermore, the evaluation of the impact of these technologies is essential in moving forward in the future. The Research Anthology on Decision Support Systems and Decision Management in Healthcare,

Business, and Engineering explores how decision support systems have been developed and implemented across diverse industries through perspectives on the technology, the utilizations of these tools, and from a decision management standpoint. The chapters will cover not only the interfaces, implementations, and functionality of these tools, but also the overall impacts they have had on the specific industries mentioned. This book also evaluates the effectiveness along with benefits and challenges of using DSS as well as the outlook for the future. This book is ideal for decision makers, IT consultants and specialists, software developers, design professionals, academicians, policymakers, researchers, professionals, and students interested in how DSS is being used in different industries.

This book constitutes the refereed proceedings of the 12th IFIP WG 5.5/SOCOLNET Advanced Doctoral Conference on Computing, Electrical and Industrial Systems, DoCEIS 2021, held in Costa de Caparica, Portugal, in July 2021.* The 34 papers presented were carefully reviewed and selected from 92 submissions. The papers present selected results produced in engineering doctoral programs and focus on technological innovation for industry and service systems. Research results and ongoing work are presented, illustrated and discussed in the following areas: collaborative networks; smart manufacturing; cyber-physical systems and digital twins; intelligent decision making; smart energy management; communications and electronics; classification systems; smart healthcare systems; and medical devices. *The conference was held virtually.

This book includes discussion on advance computer technologies suchas cloud computing, grid computing, and service computing. Inaddition, it furthers the theory and technology of gridtechnologies that is used in manufacturing, and accelerates thedevelopment of service-oriented manufacturing.

This book gathers selected research articles from the International Conference on Innovative Product Design and Intelligent Manufacturing System (ICIPDIMS 2019), held at the National Institute of Technology, Rourkela, India. The book discusses latest methods and advanced tools from different areas of design and manufacturing technology. The main topics covered include design methodologies, industry 4.0, smart manufacturing, and advances in robotics among others. The contents of this book are useful for academics as well as professionals working in industrial design, mechatronics, robotics, and automation.

This book aims at addressing the challenges of contemporary manufacturing in Industry 4.0 environment and future manufacturing (aka Industry 5.0), by implementing soft computing as one of the major sub-fields of artificial intelligence. It contributes to development and application of the soft computing systems, including links to hardware, software and enterprise systems, in resolving modern manufacturing issues in complex, highly dynamic and globalized industrial circumstances. It embraces heterogeneous complementary aspects, such as control, monitoring and modeling of

different manufacturing tasks, including intelligent robotic systems and processes, addressed by various machine learning and fuzzy techniques; modeling and parametric optimization of advanced conventional and non-conventional, eco-friendly manufacturing processes by using machine learning and evolutionary computing techniques; cybersecurity framework for Internet of Things-based systems addressing trustworthiness and resilience in machine-to-machine and human-machine collaboration; static and dynamic digital twins integration and synchronization in a smart factory environment; STEP-NC technology for a smart machine vision system, and integration of Open CNC with Service-Oriented Architecture for STEP-NC monitoring system in a smart manufacturing. Areas of interest include but are not limited to applications of soft computing to address the following: dynamic process/system modeling and simulation, dynamic process/system parametric optimization, dynamic planning and scheduling, smart, predictive maintenance, intelligent and autonomous systems, improved machine cognition, effective digital twins integration, human-machine collaboration, robots, and cobots.

To date, reconfigurable manufacturing systems (RMSs) are among the most effective manufacturing styles that can offer manufacturers an alternative way of facing up to the challenges of continual changes in production requirements within the global, competitive and dynamic manufacturing environments. However, availability of optimal process plans that are suitable for reconfigurable manufacturing is one of the key enablers - yet to be fully unlocked - for realizing the full benefits of true RMSs. To unlock the process planning key and advance the state of art of reconfigurable manufacturing in the manufacturing industry, a number of questions need to be answered: (i) what decision making models and (ii) what computational techniques, can be applied to provide optimal manufacturing process planning solutions that are suitable for logical reconfiguration in manufacturing systems? To answer these questions, you must understand how to model reconfigurable manufacturing activities in an optimization perspective. You must also understand how to develop and select appropriate optimization techniques for solving process planning problems in manufacturing systems. To this end, Process Planning Optimization in Reconfigurable Manufacturing Systems covers: the design and operation of RMSs, optimal process planning modelling for reconfigurable manufacturing and the design and implementation of heuristic algorithm design techniques. The author explores how to: model optimization problems, select suitable optimization techniques, develop optimization algorithms, comparatively analyze the performance of candidate metaheuristics and how to investigate the effects of optimal process planning solutions on operating levels in manufacturing systems. This book delineates five alternative heuristic algorithm design techniques based on simulated annealing, genetic algorithms and the boltzmann machine that are tasked to solve manufacturing process planning optimization problems in RMSs. After reading this book, you will understand: how a reconfigurable manufacturing system works, the different types of

manufacturing optimization problems associated with reconfigurable manufacturing, as well as the conventional and intelligent techniques that are suitable for solving process planning optimization problems. You will also be able to develop and implement effective optimization procedures and algorithms for a wide spectrum of optimization problems in design and reconfigurable manufacturing."

Enterprises and organizations of any kind embedded in today's economic environment are deeply dependent on their ability to take part in collaborations. Consequently, it is strongly required for them to get actively involved for their own benefit in emerging, potentially opportunistic collaborative enterprise networks. The concept of "interoperability" has been defined by INTEROP-VLab as "The ability of an enterprise system or application to interact with others at a low cost in a flexible approach". Consequently, interoperability of organizations appears as a major issue to succeed in building on the fly emerging enterprise networks. The International Conference on Interoperability for Enterprise Systems and Applications (I-ESA 2014) was held under the motto "interoperability for agility, resilience and plasticity of collaborations" on March 26-28, 2014 and organized by the Ecole des Mines d'Albi-Carmaux, France on behalf of the European Laboratory for Enterprise Interoperability (INTEROP-VLab). On March 24-25, co-located with the conference eight workshops and one doctoral symposium were held in four tracks complementing the program of the I-ESA'14 conference. The workshops and the doctoral symposium address areas of greatest current activity focusing on active discussions among the leading researchers in the area of Enterprise Interoperability. This part of the conference helps the community to operate effectively, building co-operative and supportive international links as well as providing new knowledge of on-going research to practitioners. The workshops and doctoral symposium aimed at exploiting new issues, challenges and solutions for Enterprise Interoperability (EI) and associated domains of innovation such as Smart Industry, Internet-Of-Things, Factories of the Future, EI Applications and Standardisation. These proceedings include the short papers from the I-ESA'14 workshops and the doctoral symposium. The book is split up into 9 sections, one for each workshop and one for the doctoral symposium. All sections were organized following four tracks: (1) EI and Future Internet / Factory of the Future; (2) EI Application Domains and IT; (3) EI Standards; (4) EI Doctoral Symposium. For each section, a workshop report is provided summarizing the content and the issues discussed during the sessions. The goal of the first track was to offer a discussion opportunity on interoperability issues regarding the use of Internet of Things on manufacturing environment (Workshops 1 and 3) on one hand, and regarding the potential of innovation derived from the use of digital methods, architectures and services such as Smart Networks (Workshops 2 and 4) on the other hand. The second track focused on particular application domains that are looking for innovative solutions to support their strong collaborative needs. Thus, the track developed one workshop on the use of EI solution for Future City-Logistics (Workshop 5) and one on the use of EI solutions for Crisis / Disaster Management (Workshop 6). The third track studied the recent developments in EI standardization. Two workshops were dedicated to this issue. The first one has proposed to focus on the management of standardization (Workshop 8) and the second one has chosen to work on the new knowledge on standardization developments in the manufacturing service domain (Workshop 9). The last track, the doctoral symposium presented research results from selected dissertations. The session discussed EI knowledge issues, notably in terms of gathering through social networks or Internet of Things and of exploitation through innovative decision support systems.

This book provides an introduction to the models, methods, and results of some rescheduling problems in the presence of unexpected disruption events, including job unavailability, arrival of new jobs, and machine breakdown. The occurrence of these unexpected disruptions

may cause a change in the planned schedule, which may render the originally feasible schedule infeasible. Rescheduling, which involves adjusting the original schedule to account for a disruption, is necessary in order to minimize the effects of the disruption on the performance of the system. This involves a trade-off between finding a cost-effective new schedule and avoiding excessive changes to the original schedule. This book views scheduling theory as practical theory, and it has made sure to emphasize the practical aspects of its topic coverage. Thus, this book considers some scenarios existing in most real-world environments, such as preventive machine maintenance, and deteriorating effect where the actual processing time of a job gets longer along with machine's usage and age. To alleviate the effect of disruption events, some flexible strategies are adopted, including allocation extra resources to reduce job processing times or rejection the production of some jobs. For each considered scenario, depending on the model settings and on the disruption events, this book addresses the complexity, and the design of efficient exact or approximated algorithms. Especially when optimization methods and analytic tools fall short, this book stresses metaheuristics including improved elitist non-dominated sorting genetic algorithm and differential evolution algorithm. This book also provides extensive numerical studies to evaluate the performance of the proposed algorithms. The problem of rescheduling in the presence of unexpected disruption events is of great importance for the successful implementation of real-world scheduling systems. There is now an astounding body of knowledge in this field. This book is the first monograph on rescheduling. It aims at introducing the author's research achievements in rescheduling. It is written for researchers and Ph.D. students working in scheduling theory and other members of scientific community who are interested in recent scheduling models. Our goal is to enable the reader to know about some new achievements on this topic.

Manufacturing facility layout is determined by minimizing the Material Handling (MH) cost associated with the manufacturing of products. A manufacturing facility operates in a dynamic environment where the production rates and product mix are continuously changing. In addition, the introduction of new products/machines and removal of existing products/machines render the existing layout completely unreliable to yield improved productivity. Hence, it is often necessary to analyze the current layout and redesign the layout in accordance with the constantly changes in demand. Existing methods for the analysis of redesign uses multiple, static, and tabular from-to charts. These charts assume and exhibit the timely demand as a discrete invariable quantity. A new tool, 0??Dynamic From Between Chart (DFBC)0?+ that allows easier visualization of the changes in product rates and mix is introduced and developed in this research. DFBC models the production rate changes using a continuous function. The development process of the new tool, the formulation of the cost function and its application to the solution of Dynamic Facility Layout Problems (DFLP) for multiple time periods is presented with the use of a case study. The solution methodology uses a tradeoff analysis between increased MH cost and the rearrangement cost for the transition from existing layout to a new layout. To further authenticate and strengthen the developed methodology, real world case studies are considered and evaluated. Importance of any department flow over the other departments (crossover) occurs only if there is variation in the flow volumes between relative departments. In previous research, the redesign is carried out at the end of specific time period in a given time horizon. In most instances, the need for redesign or change in flow occurs somewhere during the period and identifying such crossover points will assist to yield better savings. In addition, the exact time at which the layout should be modified can be determined. For large size problems, the number of crossover points sited in DFBC will be large and evaluating each of these points to identify the point of change in layout will be tedious and time consuming. Thus, along with the methodology to identify the crossover points a concept of Upper bound and Lower bound (UB0?3LB) to discover the set of redesign points which may warrant a change in layout has been developed. Further analysis is necessary to detect the point(s) that initiate

the change. Limiting the solution space facilitates the evaluation of large size problems by reducing and simplifying the computation. Multiple case studies are considered and evaluated to indicate the applicability of the concept. It is also evident in current manufacturing paradigms that the introduction of new products/machines and removal of existing products/machines in-between the time horizon induces huge flow variations between departments. Previous research on DFLP does not deal with models which adopt such scenarios. In this research the application of DFBC to analyze the impact of introduction of new products/machines and removal of existing products/machines in between the time horizon is considered. The ability of the DFBC to address such scenarios is evaluated using a case study. Finally, the possible extensions of this research are listed along with the conclusions on the proposed approach.

Manufacturing plays a vital role in European economy and society, and is expected to continue as a major generator of wealth in the foreseeable future. A competitive manufacturing industry is essential for the prosperity of Europe, especially in the face of accelerating deindustrialisation. This book provides a broad vision of the future of manufacturing, analysed from a system-management viewpoint and with a special focus on ICT-related matters. Each contribution presents a complex and multidisciplinary research domain from a specific perspective. The first part of the book gives an overview on technology: past, present and future, while the following topics are introduced in the latter part of the book: - Product Lifecycle Management - Sustainable Products and Processes - Production Scheduling and Control - Benchmarking and Performance Measures - Industrial Services - Human Factors and Education in Manufacturing - Collaborative Engineering - Supply Chain Integration The book is intended to provoke debate, build consensus and stimulate creative discussion, leading to further novel research initiatives in the future.

This volume represents the state-of-the-art knowledge in the area of production and manufacturing engineering and management. The contributions cover such themes as design for manufacture, AMT, manufacturing systems, knowledge-based systems. The text is interspersed with real-life industrial case study experiences, so making explicit the relevance of these research findings to the improvementof current industrial practice.

Just like the world financial system, but for different reasons, 21st-century corporations need a new business model for their enterprise supply chains. The old conventions no longer work in this new world of volatile and increasingly unpredictable demand and supply. The enterprise needs to become more 'connected' to its own parts, as well as its partners up and down the chains it participates in. So too, we need to embrace new ways of looking at customers to gain deeper, more insightful impressions of what they are telling us about the way they want to buy our products and services. Finally, these signals need converting into corresponding action, driven by the people in the business, leaders and staff alike, who are aligned to their customers' wishes. This is the world of dynamic supply chain alignment where, increasingly, supply chains are the business. In the follow-up to his hugely successful Strategic Supply Chain Alignment, John Gattorna's Dynamic Supply Chain Alignment, explores how to create and sustain multiple supply chains with a level of flexibility and responsiveness that allow you to respond to opportunities and threats; at the same time aligning with your suppliers, your partners and your customers. When more executives get to this stage of development the profits will flow more readily, and sustainability of performance will not be the same issue it is today. The way forward is right there in front of us; but, says John Gattorna, we must throw off old ways and embrace the new.

Cellular manufacturing, an application of group technology, is a stepping stone to achieve world class manufacturing status. It has emerged as an important technique to cope up with fast changing industrial demands for the application of newer manufacturing systems. This comprehensive and well written text deals with all facets of cellular manufacturing right from introduction to application in a chronological

order. The book first introduces cell formation techniques, followed by elimination of exceptional components, evaluation of solutions, cell characteristics, and production control issues like scheduling; line balancing and inventory control. Finally it discusses about the application of cellular manufacturing in a large public sector.The text is supported by numerous figures, tables and examples, and also furnishes simple algorithms for complex methods. Primarily intended for the postgraduate students of mechanical engineering and production engineering with specialization in manufacturing systems/group technology, it will also be useful for the researchers, scientists and professionals as a reference book.

The book summarizes the results of the European research project "Intelligent fixtures for the manufacturing of low rigidity components" (INTEFIX). The structure of the book follows the sub-projects which are dedicated to case studies within the scenarios "vibrations", "deformations" and "positioning". The INTEFIX project deals with the development and analysis of several exemplary types of intelligent, sensor and actuator integrated fixtures for the clamping of sensitive workpieces in cutting machine tools. Thus, the book gives a representative overview about this innovative field of technology. The demands of the case studies are described and the technological approaches and solutions are introduced. Furthermore, innovative methods for the design and optimization of intelligent fixtures are presented.

This book gathers the peer-reviewed papers presented at the 8th edition of the International Workshop "Service Orientation in Holonic and Multi-Agent Manufacturing – SOHOMA'18" held at the University of Bergamo, Italy on June 11–12, 2018. The objective of the SOHOMA annual workshops is to foster innovation in smart and sustainable manufacturing and logistics systems by promoting new concepts, methods and solutions that use service orientation of agent-based control technologies with distributed intelligence. Reflecting the theme of SOHOMA'18: "Digital transformation of manufacturing with agent-based control and service orientation of Internet-scale platforms", the research included focuses on how the digital transformation, as advocated by the "Industry 4.0", "Industrial Internet of Things", "Cyber-Physical Production Systems" and "Cloud Manufacturing" frameworks, improves the efficiency, agility and sustainability of manufacturing processes, products, and services, and how it relates to the interaction between the physical and informational worlds, which is implemented in the virtualization of products, processes and resources managed as services.

Industrial engineering affects all levels of society, with innovations in manufacturing and other forms of engineering oftentimes spawning cultural or educational shifts along with new technologies. Industrial Engineering: Concepts, Methodologies, Tools, and Applications serves as a vital compendium of research, detailing the latest research, theories, and case studies on industrial engineering. Bringing together contributions from authors around the world, this three-volume collection represents the most sophisticated research and developments from the field of industrial engineering and will prove a valuable resource for researchers, academics, and practitioners alike.

Industries and particularly the manufacturing sector have been facing difficult challenges in a context of socio-economic turbulence characterized by complexity as well as the speed of change in causal interconnections in the socio-economic environment. In

order to respond to these challenges companies are forced to seek new technological and organizational solutions. In this context two main characteristics emerge as key properties of a modern automation system – agility and distribution. Agility because systems need not only to be flexible in order to adjust to a number of a-priori defined scenarios, but rather must cope with unpredictability. Distribution in the sense that automation and business processes are becoming distributed and supported by collaborative networks. Emerging Solutions for Future Manufacturing Systems includes the papers selected for the BASYS'04 conference, which was held in Vienna, Austria in September 2004 and sponsored by the International Federation for Information Processing (IFIP).

This volume contains the technical papers presented in the workshops associated with the European Conference on Service-Oriented and Cloud Computing, ESOCC 2016, held in Vienna, Austria, in September 2016: 4th International Workshop on Cloud for IoT, CLIoT 2016, Second International Workshop on Cloud Adoption and Migration, CloudWays 2016, First International Workshop on Patterns and Pattern Languages for SOCC: Use and Discovery, PATTWORLD 2016, combined with the First International Workshop on Performance and Conformance of Workflow Engines, PEaCE 2016, IFIP WG SOS Workshop 2016 Rethinking Services ResearCH, ReSeRCH 2016. Furthermore, there is a topical section presenting the results of the PhD Symposium. The abstracts of the presentations held at the European Projects Forum, EU Projects 2016, are included in the back-matter of the volume. The 15 full papers included in this volume were carefully reviewed and selected from 49 submissions. They focus on specific topics in service-oriented and cloud computing domains such as limits and/or advantages of existing cloud solutions, future internet technologies, efficient and adaptive deployment and management of service-based applications across multiple clouds, novel cloud service migration practices and solutions, digitization of enterprises in the cloud computing era, federated cloud networking services.

This book is a collection of papers from The American Ceramic Society's 35th International Conference on Advanced Ceramics and Composites, held in Daytona Beach, Florida, January 23-28, 2011. This issue includes papers presented in the 5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems on topics such as Design-Oriented Manufacturing and Novel Forming and Sintering. Papers from a special session held in honor of Katsutoshi Komeya of Yokohama National University, Japan are also included.

This supplement contains new projects since the publication of the Project Book in Sep. 1995. Potential new starts are summarized on a single page. The summary contains an explanation of the need for the project, the approach taken to accomplish the effort, the benefits expected to be realized, the current status, the name of the project engineer, & performing contractor. Covers: advanced industrial practices, electronics, manufacturing & engineering systems, metals, nonmetals, sustainment, technology development, & Title III. Illsutrated.

This is an invaluable five-volume reference on the very broad and highly significant subject of computer aided and integrated manufacturing systems. It is a set of distinctly titled and well-harmonized volumes by leading experts on the international scene.The techniques and

technologies used in computer aided and integrated manufacturing systems have produced, and will no doubt continue to produce, major annual improvements in productivity, which is defined as the goods and services produced from each hour of work. This publication deals particularly with more effective utilization of labor and capital, especially information technology systems. Together the five volumes treat comprehensively the major techniques and technologies that are involved.

This edited volume presents the research results of the Collaborative Research Center 1026 "Sustainable manufacturing - shaping global value creation". The book aims at providing a reference guide of sustainable manufacturing for researchers, describing methodologies for development of sustainable manufacturing solutions. The volume is structured in four chapters covering the following topics: sustainable manufacturing technology, sustainable product development, sustainable value creation networks and systematic change towards sustainable manufacturing. The target audience comprises both researchers and practitioners in the field of sustainable manufacturing, but the book may also be beneficial for graduate students.

Traditional manufacturing systems rely upon centralized, hierarchical systems that are not responsive enough to the increasing demand for mass customization. Decentralized, or heterarchical, management systems using autonomous agents promise to nullify the limitations of previous solutions. Agent-Based Manufacturing and Control Systems: New

Advanced modeling techniques are a necessary tool in order to design and manage manufacturing systems effectively. This book contains a set of tutorial chapters on topics ranging from aggregate production planning to real time control, including predictive and reactive scheduling, flow management in assembly systems, simulation of robotic cells, design of manufacturing systems under uncertainty and a historical perspective on production management philosophies. The book will be of interest both to researchers and practitioners, including graduate students in Manufacturing Engineering and Operations Research.

Explains the weaknesses of traditional management practices, compares companies that are winning market position with those losing, and discusses capital budgeting, performance measurement, and personnel management

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