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Optimizing Factory Performance: Cost-Effective Ways to Achieve Significant and Sustainable Improvement

James Ignizio

2009-07-17 TQM, Reengineering, Theory of Constraints, JIT, Six Sigma, Lean Manufacturing . . . These are just some of the methods that, over the past five decades, have promised to transform any
manufacturing firm into a lean, mean, moneymaking machine. While each incorporates certain fundamental truths, strengths, and benefits, they are not panaceas. Nor do they necessarily provide much-needed insight into the science that underlies factory performance. James Ignizio, Ph.D., an internationally recognized performance optimization expert, believes that only a balanced approach will provide the significant and sustainable improvement required of firms who will survive and prosper in the twenty-first century. In this breakthrough guide, Dr. Ignizio picks up where such concepts as Six Sigma and Lean Manufacturing leave off to provide you with a holistic, three-dimensional approach to mastering the art and science of manufacturing. Focusing on the three primary enemies of factory performance—complexity, variability, and lackluster leadership—Optimizing Factory Performance cuts to the heart of the problem of less-than-world-class performance and demonstrates how those enemies manifest themselves in companies across manufacturing sectors. Ignizio also explores the insidious effect company politics and flagging commitment to manufacturing performance have on competitiveness. Emphasizing the all-important, often overlooked third dimension of manufacturing—factory protocols—Ignizio describes the types of strategic and tactical changes to physical plant and operating procedures any company can make to achieve performance improvements. In addition, he arms you with powerful, original metrics for measuring and comparing factory performance, as well as a set of interactive simulation models, available online at www.mhprofessional.com/ignizio. Running throughout the book is an often amusing, always instructive account of the fictional high-tech firm, Muddle, Inc., which helps support the concepts discussed in the real world of manufacturing, while reinforcing key lessons learned. Read Optimizing Factory Performance and find out how to transform your
organization into the kind of fast, agile manufacturer that delivers the right products to the right customers at the right time—every time.

**Optimizing Factory Performance: Cost-Effective Ways to Achieve Significant and Sustainable Improvement**

James Ignizio
2009-06-12

TQM, Reengineering, Theory of Constraints, JIT, Six Sigma, Lean Manufacturing . . . These are just some of the methods that, over the past five decades, have promised to transform any manufacturing firm into a lean, mean, moneymaking machine. While each incorporates certain fundamental truths, strengths, and benefits, they are not panaceas. Nor do they necessarily provide much-needed insight into the science that underlies factory performance. James Ignizio, Ph.D., an internationally recognized performance optimization expert, believes that only a balanced approach will provide the significant and sustainable improvement required of firms who will survive and prosper in the twenty-first century. In this breakthrough guide, Dr. Ignizio picks up where such concepts as Six Sigma and Lean Manufacturing leave off to provide you with a holistic, three-dimensional approach to mastering the art and science of manufacturing. Focusing on the three primary enemies of factory performance—complexity, variability, and lackluster leadership—Optimizing Factory Performance cuts to the heart of the problem of less-than-world-class performance and demonstrates how those enemies manifest themselves in companies across manufacturing sectors. Ignizio also explores the insidious effect company politics and flagging commitment to manufacturing performance have on competitiveness. Emphasizing the all-important, often overlooked third dimension of manufacturing—factory protocols—Ignizio describes the types of strategic and tactical changes to physical plant and operating procedures any company can
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Advances in Production Management Systems: Innovative Production Management Towards Sustainable Growth - Shigeki Umeda 2015-08-17 The two volumes IFIP AICT 459 and 460 constitute the refereed proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management Systems, APMS 2015, held in Tokyo, Japan, in September 2015. The 163 revised full papers were carefully reviewed and selected from 185 submissions. They are organized in the following topical sections: collaborative networks; globalization and production management; knowledge based production management; project management, engineering management, and quality management; sustainability and production management; co-creating sustainable business processes and ecosystems; open cloud computing architecture for smart manufacturing and cyber physical production systems; the practitioner's view on "innovative production management towards sustainable growth"; the role of additive manufacturing in value chain reconfiguration and sustainability; operations management in engineer-to-order manufacturing; lean production; sustainable system design for green products; cloud-based
manufacturing; ontology-aided production - towards open and knowledge-driven planning and control; product-service lifecycle management: knowledge-driven innovation and social implications; and service engineering.

Learning in the Digital Era - Daryl John Powell 2022-01-01
This book constitutes the refereed proceedings of the 7th European Lean Educator Conference ELEC 2021, hosted in Trondheim, Norway, in October 2021 and sponsored by IFIP WG 5.7. The conference was held virtually. The 42 full papers presented were carefully reviewed and selected from 82 submissions. They are organized in the following thematic sections: Learning Lean; Teaching Lean in the Digital Era; Lean and Digital; Lean 4.0; Lean Management; Lean Coaching and Mentoring; Skills and Knowledge Management; Productivity and Performance Improvement; New Perspectives of Lean.

Advances in Production Management Systems. The Path to Intelligent, Collaborative and Sustainable Manufacturing - Hermann Lödding 2017-08-28
The two-volume set IFIP AICT 513 and 514 constitutes the refereed proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management Systems, APMS 2017, held in Hamburg, Germany, in September 2017. The 121 revised full papers presented were carefully reviewed and selected from 163 submissions. They are organized in the following topical sections: smart manufacturing system characterization; product and asset life cycle management in smart factories of industry 4.0; cyber-physical (IIoT) technology deployments in smart manufacturing systems; multi-disciplinary collaboration in the development of smart product-service solutions; sustainable human integration in cyber-physical systems: the operator 4.0; intelligent diagnostics and maintenance solutions; operations
planning, scheduling and control; supply chain design; production management in food supply chains; factory planning; industrial and other services; operations management in engineer-to-order manufacturing; gamification of complex systems design development; lean and green manufacturing; and eco-efficiency in manufacturing operations.

**Handbook of Research on Managerial Strategies for Achieving Optimal Performance in Industrial Processes** - Alor-Hernández, Giner 2016-05-03

Competitive advantage is a key factor to the success of any business in modern society. To achieve this goal, effective strategies for process improvement must be researched and implemented into an organization. The Handbook of Research on Managerial Strategies for Achieving Optimal Performance in Industrial Processes examines optimization techniques for improved business operations and procedures in the industrial sector. Highlighting management techniques, innovative approaches, and technological tools, this publication is an essential reference source for professionals, researchers, consultants, upper-level students, and academicians interested in the advancement of knowledge in industrial communities.

**High Performance and Optimum Design of Structures and Materials III** - W. P. De Wilde 2018-12-03

Papers presented at the 2018 International Conference on High Performance and Optimum Design of Structures and Materials are contained in this volume. These papers address issues involving advanced types of structures, particularly those based on new concepts or new materials and their system design. The use of novel materials and new structural concepts nowadays is not restricted to highly technical areas like aerospace, aeronautical applications or the automotive industry, but affects all engineering fields...
including those such as civil engineering and architecture. Most high performance structures require the development of a generation of new materials, which can more easily resist a range of external stimuli or react in a non-conventional manner. Particular emphasis is placed on intelligent structures and materials as well as the application of computational methods for their modelling, control and management. Optimisation problems discussed in this book involve those related to size, shape and topology of structures and materials. Optimisation techniques have much to offer to those involved in the design of new industrial products. The development of new algorithms and the appearance of powerful commercial computer codes with easy to use graphical interfaces has created a fertile field for the incorporation of optimisation in the design process in all engineering disciplines. The latest developments in design, optimisation, manufacturing and experimentation are highlighted in this book.

Design and Optimization of Mechanical Engineering Products-Kumar, K.
2018-02-02 The success of any product sold to consumers is based, largely, on the longevity of the product. This concept can be extended by various methods of improvement including optimizing the initial creation structures which can lead to a more desired product and extend the product's time on the market. Design and Optimization of Mechanical Engineering Products is an essential research source that explores the structure and processes used in creating goods and the methods by which these goods are improved in order to continue competitiveness in the consumer market. Featuring coverage on a broad range of topics including modeling and simulation, new product development, and multi-criteria decision making, this publication is targeted toward students, practitioners, researchers, engineers, and academicians.
Metaheuristic optimization is a higher-level procedure or heuristic designed to find, generate, or select a heuristic (partial search algorithm) that may provide a sufficiently good solution to an optimization problem, especially with incomplete or imperfect information or limited computation capacity. This is usually applied when two or more objectives are to be optimized simultaneously. This book is presented with two major objectives. Firstly, it features chapters by eminent researchers in the field providing the readers about the current status of the subject. Secondly, algorithm-based optimization or advanced optimization techniques, which are applied to mostly non-engineering problems, are applied to engineering problems. This book will also serve as an aid to both research and industry. Usage of these methodologies would enable the improvement in engineering and manufacturing technology and support an organization in this era of low product life cycle. Features: Covers the application of recent and new algorithms Focuses on the development aspects such as including surrogate modeling, parallelization, game theory, and hybridization Presents the advances of engineering applications for both single-objective and multi-objective optimization problems Offers recent developments from a variety of engineering fields Discusses Optimization using Evolutionary Algorithms and Metaheuristics applications in engineering

Sustainable Green Development and Manufacturing Performance through Modern Production Techniques-Chandan Deep Singh 2021-12-10 Various Multiple Criteria Decision-Making (MCDM) techniques in one book: 13 MCDM techniques have been applied, namely, WSM, WPM, WASPAS, GRA, SMART, CRITIC, ENTROPY, EDAS, MOORA, AHP, TOPSIS, VIKOR, and new tools:
MDEMATEL, Fuzzy MDEMATEL, Modified Fuzzy TOPSIS and Modified Fuzzy VIKOR. To date, no other book possesses this many tools. Various quantitative techniques: Different quantitative techniques have been applied, namely, Cronbach alpha, Chi-square and ANOVA (for demographic analysis), Percent Point Score and Central Tendency (response analysis), Factor Analysis, Correlation and Regression. To date, no other book possesses this many tools. Interpretive Structural Modelling: ISM has been applied for verifying MCDM results through MICMAC analysis and ISM model thus paving the way for model through SEM. Structural Equation Modelling: SEM using AMOS in PASW has been applied for model development. New MCDM techniques developed: In the process during qualitative analysis, new tools have been developed and their results have been compared with other existing MCDM tools and the results are encouraging. The new techniques are MDEMATEL, Fuzzy MDEMATEL, Modified Fuzzy TOPSIS and Modified Fuzzy VIKOR. Qualitative Model Developed: As the title says, Sustainable Green Development and Manufacturing Performance through Modern Production Techniques. It is a need-of-the-hour topic, as industries must maintain their performance (sustainable development) and, while sustaining, they have to keep in mind green issues (that is, environment-related issues, especially during the COVID-19 pandemic) and adopt advanced manufacturing and maintenance techniques. A model for this has been developed which will be helpful to both academicians and industrialists. Real-time Case Studies: Case studies in two industries of differing origins, different manufacturing sectors, different products, and comparing their units in the country of their origin and India. Dr. Chandan Deep Singh is an assistant professor in the Department of Mechanical Engineering, Punjabi University, Patiala, Punjab (India). He is a co-author of Adolescents, Family...
and Consumer Behaviour (Routledge, 2020) and of Manufacturing Competency and Strategic Success in the Automobile Industry (CRC Press, 2019). Dr. Harleen Kaur is a manager (HR) at DELBREC Industries, Pvt. Ltd., Chandigarh. She co-authored Adolescents, Family and Consumer Behaviour (Routledge, 2020).

Microwave Component Mechanics-Harri Eskelinen 2003 CD-ROM contains: "several 3-D models, informative PowerPoint presentations, and dxf files of selected microwave components for direct CNC-machining."

Production Systems Engineering: Cost and Performance Optimization-Richard Gustavson 2010-01-22 Optimize Economic and Technological Requirements in Production System Designs This pioneering work offers proven techniques, partially created and developed at The Charles Stark Draper Laboratory, for determining optimal resource allocation and cost-effective production system designs for today’s any-volume manufacturing environments. Production Systems Engineering presents a unique methodology that synthesizes applicable technology with economic requirements for an integrated solution. Featuring real-world case studies, this authoritative resource establishes a new paradigm for the manufacturing world that can also be applied to other enterprise environments. Coverage includes: Determining an improved manufacturing system design method System design basics, time allocation, resources, costs, and quality rating Stochastic analyses added to deterministic results System configuration options Multiple disparate products produced by one system World class versus mostly manual systems Determining allowable investment Simultaneous improvement in yield and cycle-time

e-Design-Kuang-Hua Chang 2016-02-23 e-Design:
Computer-Aided Engineering Design, Revised First Edition is the first book to integrate a discussion of computer design tools throughout the design process. Through the use of this book, the reader will understand basic design principles and all-digital design paradigms, the CAD/CAE/CAM tools available for various design related tasks, how to put an integrated system together to conduct All-Digital Design (ADD), industrial practices in employing ADD, and tools for product development.

Comprehensive coverage of essential elements for understanding and practicing the e-Design paradigm in support of product design, including design method and process, and computer based tools and technology Part I: Product Design Modeling discusses virtual mockup of the product created in the CAD environment, including not only solid modeling and assembly theories, but also the critical design parameterization that converts the product solid model into parametric representation, enabling the search for better design alternatives Part II: Product Performance Evaluation focuses on applying CAE technologies and software tools to support evaluation of product performance, including structural analysis, fatigue and fracture, rigid body kinematics and dynamics, and failure probability prediction and reliability analysis Part III: Product Manufacturing and Cost Estimating introduces CAM technology to support manufacturing simulations and process planning, sheet forming simulation, RP technology and computer numerical control (CNC) machining for fast product prototyping, as well as manufacturing cost estimate that can be incorporated into product cost calculations Part IV: Design Theory and Methods discusses modern decision-making theory and the application of the theory to engineering design, introduces the mainstream design optimization methods for both single and multi-objectives problems through both batch and interactive design modes, and provides a brief discussion on sensitivity analysis, which is essential for
designs using gradient-based approaches. Tutorial lessons and case studies are offered for readers to gain hands-on experiences in practicing e-Design paradigm using two suites of engineering software: Pro/ENGINEER-based, including Pro/MECHANICA Structure, Pro/ENGINEER Mechanism Design, and Pro/MFG; and SolidWorks-based, including SolidWorks Simulation, SolidWorks Motion, and CAMWorks. Available on the companion website http://booksite.elsevier.com/9780123820389

Optimization of Manufacturing Processes-
Kapil Gupta 2019-06-25 This book provides a detailed understanding of optimization methods as they are implemented in a variety of manufacturing, fabrication and machining processes. It covers the implementation of statistical methods, multi-criteria decision making methods and evolutionary techniques for single and multi-objective optimization to improve quality, productivity, and sustainability in manufacturing. It reports on the theoretical aspects, special features, recent research and latest development in the field. Optimization of Manufacturing Processes is a valuable source of information for researchers and practitioners, as it fills the gap where no dedicated book is available on intelligent manufacturing/modeling and optimization in manufacturing. Readers will develop an understanding of the implementation of statistical and evolutionary techniques for modeling and optimization in manufacturing.

Design Theory and Methods using CAD/CAE-
Kuang-Hua Chang 2014-10-11 The fourth book of a four-part series, Design Theory and Methods using CAD/CAE integrates discussion of modern engineering design principles, advanced design tools, and industrial design practices throughout the design process. This is the first book to integrate discussion of computer design tools throughout the design
process. Through this book series, the reader will:
Understand basic design principles and all digital modern engineering design paradigms
Understand CAD/CAE/CAM tools available for various design related tasks
Understand how to put an integrated system together to conduct All Digital Design (ADD) product design using the paradigms and tools
Understand industrial practices in employing ADD virtual engineering design and tools for product development
The first book to integrate discussion of computer design tools throughout the design process
Demonstrates how to define a meaningful design problem and conduct systematic design using computer-based tools that will lead to a better, improved design
Fosters confidence and competency to compete in industry, especially in high-tech companies and design departments

Enrico Sciubba 2012

Modeling and Optimization in Manufacturing-Catalin I. Pruncu 2021-03-30 Discover the state-of-the-art in multiscale modeling and optimization in manufacturing from two leading voices in the field
Modeling and Optimization in Manufacturing delivers a comprehensive approach to various manufacturing processes and shows readers how multiscale modeling and optimization processes help improve upon them. The book elaborates on the foundations and applications of computational modeling and optimization processes, as well as recent developments in the field. It offers discussions of manufacturing processes, including forming, machining, casting, joining, coating, and additive manufacturing, and how computer simulations have influenced their development.
Examples for each category of manufacturing are provided in the text, and industrial applications are described for the reader. The distinguished authors also provide an insightful perspective on likely future trends and developments in manufacturing modeling and optimization, including the use of large materials databases and machine learning. Readers will also benefit from the inclusion of:

- A thorough introduction to the origins of manufacturing, the history of traditional and advanced manufacturing, and recent progress in manufacturing
- An exploration of advanced manufacturing and the environmental impact and significance of manufacturing
- Practical discussions of the economic importance of advanced manufacturing
- An examination of the sustainability of advanced manufacturing, and developing and future trends in manufacturing

Perfect for materials scientists, mechanical engineers, and process engineers, "Modeling and Optimization in Manufacturing" will also earn a place in the libraries of engineering scientists in industries seeking a one-stop reference on multiscale modeling and optimization in manufacturing.

**Soft Computing in Smart Manufacturing**

Tatjana Sibalija 2021-12-06 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.

**Process Planning Optimization in Reconfigurable Manufacturing Systems**

Farayi Musharavati 2010-09

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."

**Scientific and Technical Aerospace Reports- 1995**
Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

**Nature-Inspired Optimization in Advanced Manufacturing Processes and Systems**-Ganesh M. Kakandikar 2020-12-08 The manufacturing system is going through substantial changes and developments in light of Industry 4.0. Newer manufacturing technologies are being developed and applied. There is a need to optimize these techniques when applied in different circumstances with respect to materials, tools, product configurations, and process parameters. This book covers computational intelligence applied to manufacturing. It discusses nature-inspired optimization of processes and their design and development in manufacturing systems. It explores all manufacturing processes, at both macro and micro levels, and offers manufacturing philosophies. Nonconventional manufacturing, real industry problems and case studies, research on generative processes, and relevance of all this to Industry 4.0 is also included. Researchers, students, academicians, and industry professionals will find this reference title very useful.

**Selected Papers from PRES 2018**-Jiří Jaromír Klemeš 2020-06-17 The depletion of natural energy resources provides evidential adverse impacts on world economy functionality. The strong requirement of a sustainable energy supply has escalated intensive research and the discovery of cleaner energy sources, as well as efficient energy management practices. In the context of a circular economy, this research not only targets the optimisation of resources utilisation at different stages but also emphasises the eco-design of products to extend production life spans. Based on this concept, this book discusses the roles of process integration approaches,
renewable energy sources utilisation and design modifications in addressing the process energy and exergy efficiency improvement. The primary focus is to enhance the economic and environmental performance through process analysis, modelling and optimisation. The articles mainly show the contribution of each aspect: (a) design and numerical study for innovative energy-efficient technologies, (b) process integration—heat and power, (c) process energy efficiency or emission analysis, and (d) optimisation of renewable energy resources’ supply chain. The articles are based on the latest contribution of this journal’s Special Issues in the 21st conference entitled “Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction (PRES)”. This book is complemented with an editorial review to highlight the broader state-of-the-art development.

**System Design Optimization for Product**

**Manufacturing**-Masataka Yoshimura 2010-02-28
Readers of System Design Optimization for Product Manufacturing will learn about detailed concepts and practical technologies that enable successful product design and manufacture. These concepts and technologies are based on system optimization methodologies that consider a broad range of mechanical, as well as human, factors. System Design Optimization for Product Manufacturing explains the methodologies behind current and future product manufacture. Its detailed explanations of key concepts are relevant not only for product design and manufacture, but also for other business fields. These core concepts and methodologies can be applied to practically any field where informed decision-making is important, and where a range of often conflicting factors must be carefully weighed and considered. System Design Optimization for Product Manufacturing can be used as a fundamental reference book by both engineers and students in the
fields of manufacturing, design engineering, and product development.

**Encyclopedia of Business Analytics and Optimization**

Wang, John 2014-02-28 As the age of Big Data emerges, it becomes necessary to take the five dimensions of Big Data- volume, variety, velocity, volatility, and veracity- and focus these dimensions towards one critical emphasis - value. The Encyclopedia of Business Analytics and Optimization confronts the challenges of information retrieval in the age of Big Data by exploring recent advances in the areas of knowledge management, data visualization, interdisciplinary communication, and others. Through its critical approach and practical application, this book will be a must-have reference for any professional, leader, analyst, or manager interested in making the most of the knowledge resources at their disposal.

**Process Optimization Guide for Military Manufacturing and Maintenance Facilities**

**Simulation-based Optimization of Energy Efficiency in Production**

Anna Carina Römer 2021 The importance of the energy and commodity markets has steadily increased since the first oil crisis. The sustained use of energy and other resources has become a basic requirement for a company to competitively perform on the market. The modeling, analysis and assessment of dynamic production processes is often performed using simulation software. While existing approaches mainly focus on the consideration of resource consumption variables based on metrologically collected data on operating states, the aim of this work is to depict the energy consumption of production plants through the utilization of a continuous simulation approach in combination with a discrete approach for the modeling of material flows and supporting...
logistic processes. The complex interactions between the material flow and the energy usage in production can thus be simulated closer to reality, especially the depiction of energy consumption peaks becomes possible. An essential step towards reducing energy consumption in production is the optimization of the energy use of non-value-adding production phases. About the author: Anna Carina Romer was an external doctoral student at the Department of Information Technology in Production and Logistics at the Technische Universität Ilmenau. The main focus of her research was on hybrid simulation models, with a focus on both the conceptual design of hybrid simulation models and the use of hybrid models for the optimization of energy consumption in production plants.

**SPS2020-K. Säfsten**
2020-12-24 Knowledge-intensive product realization implies embedded intelligence; meaning that if both theoretical and practical knowledge and understanding of a subject is integrated into the design and production processes of products, this will significantly increase added value. This book presents papers accepted for the 9th Swedish Production Symposium (SPS2020), hosted by the School of Engineering, Jönköping University, Sweden, and held online on 7 & 8 October 2020 because of restrictions due to the Corona virus pandemic. The subtitle of the conference was Knowledge Intensive Product Realization in Co-Operation for Future Sustainable Competitiveness. The book contains the 57 papers accepted for presentation at the conference, and these are divided into nine sections which reflect the topics covered: resource efficient production; flexible production; virtual production development; humans in production systems; circular production systems and maintenance; integrated product and production development; advanced and optimized components, materials and manufacturing; digitalization for smart products and services; and responsive and efficient
Gas Turbines Modeling, Simulation, and Control: Using Artificial Neural Networks provides new approaches and novel solutions to the modeling, simulation, and control of gas turbines (GTs) using artificial neural networks (ANNs). After delivering a brief introduction to GT performance and classification, the book:

- Outlines important criteria to consider at the beginning of the GT modeling process, such as GT types and configurations, control system types and configurations, and modeling methods and objectives.
- Highlights research in the fields of white-box and black-box modeling, simulation, and control of GTs, exploring models of low-power GTs, industrial power plant gas turbines (IPGTs), and aero GTs.
- Discusses the structure of ANNs and the ANN-based model-building process, including system analysis, data acquisition and preparation, network architecture, and network training and validation.
- Presents a noteworthy ANN-based methodology for offline system identification of GTs, complete with validated models using both simulated and real operational data.
- Covers the modeling of GT transient behavior and start-up operation, and the design of proportional-integral-derivative (PID) and neural network-based controllers.

Gas Turbines Modeling, Simulation, and Control: Using Artificial Neural Networks not only offers a comprehensive review of the state of the art of gas turbine modeling and intelligent techniques, but also
demonstrates how artificial intelligence can be used to solve complicated industrial problems, specifically in the area of GTs.

Visionary Manufacturing Challenges for 2020-
National Research Council 1998-12-18 Manufacturing will unquestionably be a very different enterprise in 2020 from what it is today. This book presents an exciting picture of the profitable and productive potential of manufacturing two decades hence. This book takes an international view of future manufacturing that considers the leaps and bounds of technological innovation and the blurring of the lines between the manufacturing and service industries. The authors identify ten strategic technology areas as the most important for research and development and they recommend ways to address crosscutting questions. Representing a variety of industries, the authors identify six "grand challenges" that must be overcome for their vision to be realized, including the human/technology interface, environmental concerns, and miniaturization. A host of issues are discussed that will push and pull at manufacturing over the next 20 years: the changing workforce, the changing consumer, the rise of bio- and nanotechnology, the prospects for waste-free processing, simulation and modeling as design tools, shifts in global competition, and much more. The information and analyses in this book will be vitally important to everyone concerned about the future of manufacturing: policymakers, executives, design and engineering professionals, researchers, faculty, and students.

Innovative Process Optimization Methods in Logistics-Thorsten Blecker 2010

Intelligent Manufacturing & Mechatronics-Mohd Hasnun Arif Hassan 2018-04-27 This book presents the proceedings of
SympoSIMM 2018, the 1st edition of the Symposium on Intelligent Manufacturing and Mechatronics. With the theme of “Strengthening Innovations Towards Industry 4.0”, the book comprises the studies towards the particularity of Industry 4.0’s current trends. It is divided into five parts covering various scopes of manufacturing engineering and mechatronics stream, namely Intelligent Manufacturing, Robotics, Artificial Intelligence, Instrumentation, and Modelling and Simulation. It is hoped that this book will benefit the readers in embracing the new era of Industrial Revolution 4.0.

**High Value Manufacturing: Advanced Research in Virtual and Rapid Prototyping** - Maria K. Todd
2013-09-16 High Value Manufacturing is the result of the 6th International Conference on Advanced Research in Virtual and Rapid Prototyping, held in Leiria, Portugal, October 2013. It contains current contributions to the field of virtual and rapid prototyping (V&RP) and is also focused on promoting better links between industry and academia. This volume

**Re-engineering Manufacturing for Sustainability** - Andrew Y. C. Nee
2013-04-08 This edited volume presents the proceedings of the 20th CIRP LCE Conference, which cover various areas in life cycle engineering such as life cycle design, end-of-life management, manufacturing processes, manufacturing systems, methods and tools for sustainability, social sustainability, supply chain management, remanufacturing, etc.

**Manufacturing Engineering: Principles For Optimization** - Daniel T. Koenig
1994-08-01 Offers instruction in manufacturing engineering management strategies to help the student optimize future manufacturing processes and procedures. This edition includes innovations that have changed management's
approach toward the uses of manufacturing engineering within the business continuum.

**Advanced Technologies for Gas Turbines**-National Academies of Sciences, Engineering, and Medicine 2020-03-19 Leadership in gas turbine technologies is of continuing importance as the value of gas turbine production is projected to grow substantially by 2030 and beyond. Power generation, aviation, and the oil and gas industries rely on advanced technologies for gas turbines. Market trends including world demographics, energy security and resilience, decarbonization, and customer profiles are rapidly changing and influencing the future of these industries and gas turbine technologies. Technology trends that define the technological environment in which gas turbine research and development will take place are also changing - including inexpensive, large scale computational capabilities, highly autonomous systems, additive manufacturing, and cybersecurity. It is important to evaluate how these changes influence the gas turbine industry and how to manage these changes moving forward. Advanced Technologies for Gas Turbines identifies high-priority opportunities for improving and creating advanced technologies that can be introduced into the design and manufacture of gas turbines to enhance their performance. The goals of this report are to assess the 2030 gas turbine global landscape via analysis of global leadership, market trends, and technology trends that impact gas turbine applications, develop a prioritization process, define high-priority research goals, identify high-priority research areas and topics to achieve the specified goals, and direct future research. Findings and recommendations from this report are important in guiding research within the gas turbine industry and advancing electrical power generation, commercial and military aviation, and oil and gas production.
Stochastic Modeling and Optimization of Manufacturing Systems and Supply Chains-J. George Shanthikumar 2012-12-06
This volume originates from two workshops, both focusing on themes that are reflected in the title of the volume. The first workshop took place at Eindhoven University of Technology, April 24-26, 2001, on the occasion of the University granting a doctorate honoris causa to Professor John A. Buzacott. The second workshop was held on June 15, 2002 at Cornell University (preceding the annual INFORMSjMSOM Conference), honoring John's retirement and his lifetime contributions. Each of the two workshops consisted of about a dozen technical presentations. The objective of the volume, however, is not to simply publish the proceedings of the two workshops. Rather, our objective is to put together a select set of articles, each organized into a well-written chapter, focusing on a timely topic. Collected into a single volume, these chapters aim to serve as a useful reference for researchers and practitioners alike, and also as reading materials for graduate courses or seminars.

Handbook of Research on Manufacturing Process Modeling and Optimization Strategies-Das, Raja 2017-03-10
Recent improvements in business process strategies have allowed more opportunities to attain greater developmental performances. This has led to higher success in day-to-day production and overall competitive advantage. The Handbook of Research on Manufacturing Process Modeling and Optimization Strategies is a pivotal reference source for the latest research on the various manufacturing methodologies and highlights the best optimization approaches to achieve boosted process performance. Featuring extensive coverage on relevant areas such as genetic algorithms, fuzzy set theory, and soft computing techniques, this publication is an ideal resource for
Design and Management of Manufacturing Systems - Arkadiusz Gola 2021-09-02
Although the design and management of manufacturing systems have been explored in the literature for many years now, they still remain topical problems in the current scientific research. The changing market trends, globalization, the constant pressure to reduce production costs, and technical and technological progress make it necessary to search for new manufacturing methods and ways of organizing them, and to modify manufacturing system design paradigms. This book presents current research in different areas connected with the design and management of manufacturing systems and covers such subject areas as: methods supporting the design of manufacturing systems, methods of improving maintenance processes in companies, the design and improvement of manufacturing processes, the control of production processes in modern manufacturing systems production methods and techniques used in modern manufacturing systems and environmental aspects of production and their impact on the design and management of manufacturing systems. The wide range of research findings reported in this book confirms that the design of manufacturing systems is a complex problem and that the achievement of goals set for modern manufacturing systems requires interdisciplinary knowledge and the simultaneous design of the product, process and system, as well as the knowledge of modern manufacturing and organizational methods and techniques.

This book is a printed edition of
the Special Issue "Offshore Renewable Energy: Ocean Waves, Tides and Offshore Wind" that was published in Energies

**Department of Defense Appropriations for 1998-**