Industry 4 0: The Industrial Internet Of Things

This book presents selected papers from the 1st International Conference on Industry 4.0 and Advanced Manufacturing held at the Indian Institute of Science, Bangalore and includes deliberations from stakeholders in manufacturing and Industry 4.0 on the nature, needs, challenges, opportunities, problems, and solutions in these transformational areas. Special emphasis is placed on exploring avenues for creating a vision of, and enablers for, sustainable, affordable, and human-centric Industry 4.0. The book showcases cutting edge practice, research, and educational innovation in this crucial and rapidly evolving area. This book will be useful to researchers in academia and industry, and will also be useful to policymakers involved in creating ecosystems for implementation of Industry 4.0.

This book provides a comprehensive guide to Industry 4.0 applications, not only introducing implementation aspects but also proposing a conceptual framework with respect to the design principles. In addition, it discusses the effects of Industry 4.0, which are reflected in new business models and workforce transformation. The book then examines the key technological advances that form the pillars of Industry 4.0 and explores their potential technical and economic benefits using examples of real-world applications. The changing dynamics of global production, such as more complex and automated processes, high-level competitiveness and emerging technologies, have paved the way for a new generation of goods, products and services. Moreover, manufacturers are increasingly realizing the value of the data that their processes and products generate. Such trends are transforming manufacturing industry to the next generation, namely Industry 4.0, which is based on the integration of information and communication technologies and industrial technology.The book provides a conceptual framework and roadmap for decision-makers for this transformation

Delve into industrial digital transformation and learn how to implement modern business strategies powered by digital technologies as well as organization and cultural optimizationKey Features* Identify potential industry disruptors from various business domains and emerging technologies* Leverage existing resources to identify new avenues for generating digital revenue* Boost digital transformation with cloud computing, big data, artificial intelligence (AI), and the Internet of Things (IoT)Book DescriptionDigital transformation requires the ability to identify opportunities across industries and apply the right technologies and tools to achieve results. This book is divided into two parts with the first covering what digital transformation is and why it is important. The second part focuses on how digital transformation works.After an introduction to digital transformation, you will explore the transformation journey in logical steps and understand how to build business cases and create productivity benefit statements. Next, you'll delve into advanced topics relating to overcoming various challenges. Later, the book will take you through case studies in both private and public sector organizations. You'll explore private sector organizations such as industrial and hi-tech manufacturing in detail and get to grips with public sector organizations by learning how transformation can be achieved on a global scale and how the resident experience can be improved. In addition to this, you will understand the role of artificial intelligence, machine learning and deep learning in digital transformation. Finally, you'll discover how to create a playbook that can ensure success in digital transformation.By the end of this book, you'll be well-versed with industrial digital transformation and be able to apply your skills in the real world.What you will learn* Get up to speed with digital transformation and its important aspects* Explore the skills that are needed to execute the transformation* Focus on the concepts of Digital Thread and Digital Twin* Understand how to leverage the ecosystem for successful transformation* Get to grips with various case studies spanning industries in both private and public sectors* Discover how to execute transformation at a global scale* Find out how AI delivers value in the transformation journeyWho this book is forThis book is for IT leaders, digital strategy leaders, line-of-business leaders, solution architects, and IT business partners looking for digital transformation opportunities within their organizations. Professionals from service and management consulting firms will also find this book useful. Basic knowledge of enterprise IT and some intermediate knowledge of identifying digital revenue streams or internal transformation opportunities are required to get started with this book.

This book gathers extended versions of the best papers presented at the Global Joint Conference on Industrial Engineering and Its Application Areas (GJCIE), held in Vienna on July 20-21, 2017. They offer a snapshot of the current state of the art in three main related fields of research, namely industrial engineering, engineering and technology management, and healthcare systems engineering management. The book is intended to integrate theory and practice and to merge different perspectives, from the academic to the industrial and governmental one.

The objective of this book is to support readers facing the urgency, challenges, analysis, and methodologies to reconfiguration. It presents a comprehensive framework for reconfiguring manufacturing enterprises and provides a set of valuable conceptual frameworks and methodologies for analyzing, evaluating, and assessing reconfiguration indices. This book offers practical guidance for implementing the Fourth Industrial Revolution (Industry 4.0). It presents open-ended problems pertaining to the concepts covered in the book and provides a new approach for reconfiguring industrial systems. Not only is this book for industrialists and academics, it will also appeal to undergraduate and graduate students studying industrial, mechanical, and manufacturing engineering. Scholars and practitioners in operations management will also find this book of interest.

Key Issues, Concerns, and Prospects

Industry 4.0 Technologies

The Future of the Industrial Economy

The Industrial Internet of Things

New Trends in the Use of Artificial Intelligence for the Industry 4.0

Industry 4.0: Industrial Revolution of the 21st Century

The industrial model is changing at a vertigo speed and in this book we discover the most innovative technology that makes it possible with the aim that students and new professionals can enrich their knowledge and contribute innovative ideas to their future business. With the reading of this book, written in a language understandable to non-specialists, we will get to know the technology that makes possible the fourth Industrial Revolution, the changes it will generate and the benefits of its application.IoT, AGV, RFID, RTLS, Additive Manufacturing, Collaborative Robots, PLM, Digital Twin, CPS, etc. ... are some KETs (key enabling technologies) that we are going to show you.

This book addresses the rising productivity gap between the global frontier and other firms, and identifies a number of structural impediments constraining business start-ups, knowledge diffusion and resource allocation (such as barriers to up-scaling and relatively high rates of skill mismatch).

This two-volume set constitutes the proceedings of the 19th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2020, held in Skukuza, South Africa, in April 2020.* The total of 80 full and 7 short papers presented in these volumes were carefully reviewed and selected from 191 submissions. The papers are organized in the following topical sections: Part I: block chain: fourth industrial revolution: eBusiness: business processes: big data and machine learning: and ICT and education Part II: eGovernment: eHealth: security: social media: knowledge and knowledge management: ICT and gender equality and development: information systems for governance: and user experience and usability *Due to the global COVID-19 pandemic and the consequential worldwide imposed travel restrictions and lockdown, the I3E 2020 conference event scheduled to take place in Skukuza, South Africa, was unfortunately cancelled.

Industrial IoT (IIoT) and Industry 4.0 are newly developing and fast emerging domains of interest among students, researchers, and professionals in academia and industry. Due to the popular demand of this topic, Introduction to Industrial Internet of Things and Industry 4.0 is written to serve a diverse readership from the domains of computer science and engineering, mechanical engineering, information technology, industrial engineering, electronics engineering, and other related branches of engineering. Based on the lead author's massive open online courses (MOOCs), this book can be used as a textbook on the emerging paradigm of Industry 4.0 and IIoT, as well as a reference for professionals working in sectors of IIoT. The book covers the significant aspects of IIoT in detail, including sensors, actuators, data transmission, and data acquisition, which form the core of IIoT. Topics and concepts are presented in a comprehensive manner, so that readers can develop expertise and knowledge. The book helps beginners to gain a basic idea of Industry 4.0 and IIoT as the first section is an overview of IoT applications, infrastructure-based protocols, cloud computing, and fog computing. The second section is designed to impart a basic knowledge of Industry 4.0 and IIoT as well as of the different phases of development in industry. Delving into more advanced areas, other sections in the book cover: The business models and reference architecture of IIoT The technological aspects of Industry 4.0 and IIoT Predictive and prescriptive analytics applied in IIoT-based implementations Applications and case studies of IIoT Key enabling technologies of IIoT To aid students and professional master IIoT and Industry 4.0, the book includes conceptual questions, exercises, and learning objectives.

Advances in Mathematics for Industry 4.0 examines key tools, techniques, strategies, and methods in engineering applications. By covering the latest knowledge in technology for engineering design and manufacture, chapters provide systematic and comprehensive coverage of key drivers in rapid economic development. Written by leading industry experts, chapter authors explore managing big data in processing information and helping in decision-making, including mathematical and optimization techniques for dealing with large amounts of data in short periods. Focuses on recent research in mathematics applications for Industry 4.0 Provides insights on international and transnational scales Identifies mathematics knowledge gaps for Industry 4.0 Describes fruitful areas for further research in industrial mathematics, including forthcoming international studies and research

Towards a Wasteless Future or a Wasteful Planet?

Industry 4.0 and Circular Economy

Smart Agents for the Industry 4.0

The Fourth Industrial Revolution (Industry 4.0)

Accelerate Digital Transformation with Business Optimization, AI, and Industry 4. 0

Understanding Industry 4.0

Industry 4.0 is a challenge for today's businesses. It's a concept that encompasses the technological innovations of automation, control, and information technology, as it's applied to manufacturing processes. It's a new topic that recently emerged in academia and industry, with few books that target both management and engineering. This book will cover the new advances and the way to manage competitive organizations. The chapters will include terms of theory, evidence, and/or methodology, and significantly advance social scientific research. This book: Focuses on the latest and most recent research findings occurring on the topic of Industry 4.0 Presents the ways companies around the world are facing today's technological challenges Assists researchers and practitioners in selecting the correct options and strategies to manage competitive organizations Provides recent advances in international studies Encompasses the main technological innovations in the fields of automation, control, and information technology applied to the manufacturing processes Industry 4.0: Challenges, Trends, and Solutions in Manangment and Engineering is designed to increase the knowledge and effectiveness of all managers and engineers in all organizations and activity sectors Carolina Machado has been teaching in the Human Resources Management subjects since 1989 at University of Minho, Portugal. She has been an associate professor since 2004, with experience and research interest areas in the field of Human Resource Management, International Human Resource Management, Human Resource Management in SMEs, Training and Development, Emotional Intelligence, Management Change, Knowledge Management, and Management/HRM in the Digital Age. She is head of the Department of Management and head of the Human Resources Management Work Group at University of Minho, as well as chief editor of the International Journal of Applied Management Sciences and Engineering (IJAMSE). J. Paulo Davim is a professor at the Department of Mechanical Engineering of the University of Aveiro, Portugal. He has more than 30 years of teaching and research experience in Manufacturing, Materials, Mechanical, and Industrial Engineering, with special emphasis in Machining & Tribology. He has also interest in Management, Engineering Education, and Higher Education for Sustainability. He has worked as evaluator of projects for ERC (European Research Council) and other international research agencies.

Industry 4.0The Industrial Internet of ThingsApress

When the term 'industrial revolution' comes into mind, everything starts coming back from scratch. The Industry 4.0' or the digitalization, took place in the economic industry for bringing a great transformation. The approach of the Industry 4.0 is simple and beneficial. The main purpose of the Industry 4.0 is to provide a platform to such companies which haven't reached an international level. At the same time, it is very helpful in bringing and applying new technologies that are used for the Industries in many ways. The Industry 4.0 has given new heights to the digitalization and because of it; the digital technology is serving at the pinnacle. The technology or the technique of the fourth industrial revolution is required to access better information for the smooth working of a company.Along with this, the smooth execution of works, with full security and privacy is also the main concern. The Industry 4.0 is providing better ways for communicating with machines as well as humans. Here is a precise discussion about the whole technique.

Explore the current state of the production, processing, and manufacturing industries and discover what it will take to achieve re-industrialization of the former industrial powerhouses that can counterbalance the benefits of cheap labor providers dominating the industrial sector. This book explores the potential for the Internet of Things (IoT), Big Data, Cyber-Physical Systems (CPS), and Smart Factory technologies to replace the still largely mechanical, people-based systems of offshore locations. Industry 4.0: The Industrial Internet of Things covers Industry 4.0, a term that encapsulates trends and technologies that could rewrite the rules of manufacturing and production. What You'll Learn: Discover the Industrial Internet and Industrial Internet of Things See the technologies that must advance to enable Industry 4.0 and learn what is happening to make that happen Observe examples of the implementation of Industry 4.0 Apply some of these case studies Discover the potential to take back the lead in manufacturing, and the potential fallout that could result Who This Book Is For: Business futurists, business strategists, CEOs and CTOs, and anyone with an interest and an IT or business background; or anyone who may have a keen interest in how the future of IT, industry and production will develop over the next two decades.

How the marriage of Industry 4.0 and the Circular Economy can radically transform waste management—and our world Do we really have to make a choice between a wasteless and nonproductive world or a wasteful and ultimately self-destructive one? Futurist and world-renowned waste management scientist Antonis Mavropoulos and sustainable business developer and digital strategist Anders Nilsen respond with a ringing and optimistic "No!" They explore the Earth-changing potential of a happy (and wasteless) marriage between Industry 4.0 and a Circular Economy that could—with properly reshaped waste management practices—deliver transformative environmental, health, and societal benefits. This book is about the possibility of a brand-new world and the challenges to achieve it. The fourth industrial revolution has given us innovations including robotics, artificial intelligence, 3D-printing, and biotech. By using these technologies to advance the Circular Economy—where industry produces more durable materials and runs on its own byproducts—the waste management industry will become a central element of a more sustainable world and can ensure its own, but well beyond business as usual, future. Mavropoulos and Nilsen look at how this can be achieved—a wasteless world will require more waste management—and examine obstacles and opportunities such as demographics, urbanization, global warming, and the environmental strain caused by the rise of the global middle class. · Explore the new prevention, reduction, and elimination methods transforming waste management · Comprehend and capitalize on the business implications for the sector · Understand the theory via practical examples and case studies · Appreciate the social benefits of the new approach Waste-management has always been vital for the protection of health and the environment. Now it can become a crucial role model in showing how Industry 4.0 and the Circular Economy can converge to ensure flourishing, sustainable—and much brighter—future.

Challenges, Opportunities and Requirements

Hands-On Industrial Internet of Things

Industry 4. 0

The Goal Is Industry 4. 0

Implementing Industry 4.0

Industry 4.0 and Advanced Manufacturing

This book relates research being implemented in three main research areas: secure connectivity and intelligent systems, real-time analytics and manufacturing knowledge and virtual manufacturing. Manufacturing SMEs and MNCs want to see how Industry 4.0 is implemented. On the other hand, groundbreaking research on this topic is constantly growing. For the aforesaid reason, the Singapore Agency for Science, Technology and Research (A*STAR), has created the model factory initiative. In the model factory, manufacturers, technology providers and the broader industry can (i) learn how I4.0 technologies are implemented on real-world manufacturing use-cases, (ii) test process improvements enabled by such technologies at the model factory facility, without disrupting their own operations, (iii) co-develop technology solutions and (iv) support the adoption of solutions at their everyday industrial operation. The book constitutes a clear base ground not only for inspiration of researchers, but also for companies who will want to adopt smart manufacturing approaches coming from Industry 4.0 in their pathway to digitization.

Industrial IoT (IIoT) and Industry 4.0 are newly developing and fast emerging domains of interest among students, researchers, and professionals in academia and industry. Due to the popular demand of this topic, Introduction to Industrial Internet of Things and Industry 4.0 is written to serve a diverse readership from the domains of computer science and engineering, mechanical engineering, information technology, industrial engineering, electronics engineering, and other related branches of engineering. Based on the lead author's massive open online courses (MOOCs), this book can be used as a reference for professionals working in sectors of IIoT. The book covers the significant aspects of IIoT in detail, including sensors, actuators, data transmission, and data acquisition, which form the core of IIoT. Topics and concepts are presented in a comprehensive manner, so that readers can develop expertise and knowledge. The book helps beginners to gain a basic idea of Industry 4.0 and IIoT as the first section is an overview of IoT applications, infrastructure-based protocols, cloud computing, and fog computing. The second section is designed to impart a basic knowledge of Industry 4.0 and IIoT as well as of the different phases of development in industry. Delving into more advanced areas, other sections in the book cover: The business models and reference architecture of IIoT The technological aspects of Industry 4.0 and IIoT Predictive and prescriptive analytics applied in IIoT-based implementations Applications and case studies of IIoT Key enabling technologies of IIoT To aid students and professional master IIoT and Industry 4.0, the book includes conceptual questions, exercises, and learning objectives.

Build a strong and efficient IoT infrastructure at industrial and enterprise level by mastering Industrial IoT network Key FeaturesGain hands-on experience working with industrial architectureExplore the potential of cloud-based Industrial IoT platforms, analytics, and protocolsImprove business models and transform your workforce with Industry 4.0Book Description We live in an era where advanced automation is used to achieve accurate results. To set up an automation environment, you need to first configure a network that can be accessed anywhere and by any device. This book is a practical guide that helps you discover the technologies and use cases for Industrial Internet of Things (IIOT). Hands-On Industrial Internet of Things takes you through the implementation of industrial processes and specialized control devices and protocols. You'll study the process of identifying and connecting to different industrial data sources gathered from different sensors. Furthermore, you'll be able to connect these sensors to cloud network, such as AWS IoT, Azure IoT, Google IoT, and OEM IoT platforms, and extract data from the cloud to your devices. As you progress through the chapters, you'll gain hands-on experience in using open source Node-Red, Kafka, Cassandra, and Python. You will also learn how to develop streaming and batch-based Machine Learning algorithms. By the end of this book, you will have mastered the features of Industry 4.0 and be able to build stronger, faster, and more reliable IoT infrastructure in your Industry. What you will learnExplore industrial processes, devices, and protocolsDesign and implement the I-IoT network flowGather and transfer industrial data in a secure wayGet to grips with popular cloud-based platformsUnderstand diagnostic analytics to answer critical workforce questionsDiscover the Edge device and understand Edge and Fog computingImplement equipment and process management to achieve business-specific goalsWho this book is for If you're an IoT architect, developer, or stakeholder working with architectural aspects of Industrial Internet of Things, this book is for you.

This edited volume brings together a group of expert contributors to explorebthe opportunities and the challenges that Industry 4.0 (smart manufacturing) is likely to pose for regions, fi rms and jobs in Europe. Drawing on theory and empirical cases, it considers emerging issues like servitization, new innovation models for local production systems and the increase in reshoring. Industry 4.0 and Regional Transformations captures the complexity of this new manufacturing model in an accessible way and considers its implications for the future. It will be essential reading for advanced students and researchers and policy makers in regional studies, industrial policy, economic geography, innovation studies, operations management and engineering.

Industry 4.0 is not only just a new sector of economy—it is a new technological model of economic development, which will determine the technical possibilities, organizational philosophies, and approaches to managing socio-economic systems in the near future. Signs of the Fourth Industrial Revolution can already be seen in the most progressive developed and developing countries. However, despite the high interest of entrepreneurs in the possibilities that are provided by Industry 4.0, large-scale investment projects and the adoption of state and national strategies and programs to facilitate the financing and transition to Industry 4.0, the Fourth Industrial Revolution is developing very slowly. The reason for this is the non-systemic character of the implemented initiatives.

Introduction to Industrial Internet of Things and Industry 4.0

Anticipating and Preparing for Emerging Skills and Jobs

Smart Citizens in Smart Cities

Industry 4.0: Managing The Digital Transformation

Implications for Management, Economics and Law

This book includes chapters related to the analysis of cultural differences as a tool to enrich tacit knowledge and make processes more efficient, the factors that influence job satisfaction and the value of social capital as a competitive strategy to achieve productivity and competitiveness of organizations, in addition to research of the utmost importance to discov

facets of the diamond with respect to the symbolic capital of the organizations where Generation Z will work and how it will discover the best time to establish an innovation ecosystem that will influence its work trajectory. Industry 4.0 requires a major paradigm shift, since human capital is a source of competitive advantage. Being competitive enables to a company, region, a society or a country the power to advance in different areas, contributing to the benefit of a social group, therefore, and organizations need to make efforts that lead to adding value and generate a competitive advantage. Industrial applications based on artificial intelligence can change our lives in just one generation. The chapters in this book show progress and challenges related to real-world applications, as well as the need to strengthen human capital to achieve systemic and comprehensive competitiveness required in the XXI century.

With the rapid changes in technology that characterize the Fourth Industrial Revolution comes social evolution and the potential for future social crises. Understanding Industry 4.0 looks to determine the most probable oncoming changes and highlight the most important professions of the future.

Digital Industry can provide the framework for examining the challenges of future production technology. This book describes some of the various aspects that can, and may, influence future manufacturing. Computational intelligence techniques, cyber-physical systems, virtual and cloud-based manufacturing and man-machine interaction are studied and some of the most recent research completed by international experts in industry and academia is considered. Case studies provide practical solutions.

Explore the current state of the production, processing, and manufacturing industries and discover what it will take to achieve re-industrialization of the former industrial powerhouses that can counterbalance the benefits of cheap labor providers dominating the industrial sector. This book explores the potential for the Internet of Things (IoT), Big Data, Cyber-Physical Systems (CPS), and Smart Factory technologies to replace the still largely mechanical, people-based systems of offshore locations. Industry 4.O: The Industrial Internet of Things covers Industry 4.0, a term that encapsulates trends and technologies that could rewrite the rules of manufacturing and production. What You'll Learn: What are the Industrial Internet and Industrial Internet of Things Which technologies must advance to enable Industry 4.0 What is happening today to make that happen What are examples of the implementation of Industry 4.0 How to apply some of these case studies What is the potential to take back the lead in manufacturing, and the potential fallout that could result /div Who This Book is For: Business futurists, business strategists, CEOs and CTOs, and anyone with an interest and an IT or business background; or anyone who may have a keen interest in how the future of IT, industry and production will develop over the next two decades.

Three industrial revolutions have been among the most seminal events in human history, and now we are in the fourth, Industry 4.O. From time immemorial, we have created breakthroughs with any number of devices, machines, and methodologies, all in an effort to make our lives easier. But each new age of innovation has brought ever more daunting challenges to our very existence. Today's technological revolution, Industry 4.0, is fundamentally changing every aspect of our lives more radically than ever before. To be successful in this revolution, one must be able to adapt to those profound changes, since all of us are vulnerable to being displaced by software programs, robots, or artificial intelligence. Like individuals, companies that have been unable to transition to Industry 4.0 have declined or even declared bankruptcy, while new startups have made their creators billionaires. The old rules no longer apply. We need to wake up to the realities that are taking place now and will inevitably continue into the future.

Proceedings of I-4AM 2019
Advances in Mathematics for Industry 4.0
Reconfigurable Manufacturing Enterprises for Industry 4.0
The Fourth Industrial Revolution
AI, the Internet of Things, and the Future of Work
Sustainability in Industry 4.0

This open access book analyzes the main drivers that are influencing the dramatic evolution of work in Asia and the Pacific and identifies the implications for education and training in the region. It also assesses how education and training philosophies, curricula, and pedagogy can be reshaped to produce workers with the skills required to meet the emerging demands of the Fourth Industrial Revolution. The book's 40 articles cover a wide range of topics and reflect the diverse perspectives of the eminent policy makers, practitioners, and researchers who authored them. To maximize its potential impact, this Springer-Asian Development Bank co-publication has been made available as open access.

The industrial model is changing at a vertigo speed. This book includes an overview of Industry 4.0 and a wide overview and summary of a lot of the trends. A variety of the technologies involved and some key differences between them were covered, allowing readers to take some notes (which will serve as areas of additional research). You will discover the most innovative technology that makes it possible with the aim that students and new professionals can enrich their knowledge and contribute innovative ideas to their future business. With the reading of this book, written in a language understandable to non-specialists, we will get to know the technology that makes possible the fourth Industrial Revolution, the changes it will generate, and the benefits of its application. IoT, AGV, RFID, RTLS, Additive Manufacturing, Collaborative Robots, PLM, Digital Twin, CPS, etc. ... are some KETs (key enabling technologies) that we are going to show you.

A digital manufacturer's guide to gaining a tech advantage and taking a commercial lead with Industry 4.0 Manufacturing is in the midst of a revolution. Whole supply chains are becoming visible. Innovation is speeding up and becoming more open. Data is being shared and value is being created in real time. Potentially, performance can be transformed and new markets created, either by existing players or disruptive ventures. For all the excitement of the Fourth Industrial Revolution or Industry 4.0, the risks are too often overlooked. Like other digital markets, value can just flow to the top, leading everyone else to struggle as commodities. Manufacturers can adopt all the technologies, but still find themselves falling back, as many now are. Their challenge is to start playing by the new digital rules and capture the value in their performance. This book, written by a leading expert and practitioner in Industry 4.0, gives those on the manufacturing frontline a set of tools, templates and guidelines to start gaining a technology advantage and taking a commercial lead. Based on a comprehensive review of how manufacturing contracts are currently being written and negotiated, it highlights the questions for manufacturers to ask and reviews their options for managing innovation, designing business models, managing intellectual property and gaining a lasting source of competitive advantage. COMMENTS 'Essential reading for anyone embarking on an Industry 4.0 transformation', Brian Reilly, head of business development, Flags Software. 'A compelling book that offers intelligence and practical tools for creating new value chains from the Industry 4.0 eco-system', Deepak Farmah, head of industrial innovation, Coventry University. 'A valuable read that signposts how you and your team can make the right decisions at the right time', Christopher Greenough, chief commercial officer, SDE Technology. 'Recommended for young engineers looking to get ahead of the curve in manufacturing', Babak Jahanbani, managing director, Festo Didactic. CONTENTS (1) The fourth industrial revolution (2) Defining characteristics of Industry 4.0 (3) Transforming digital value (4) The human dimension of Industry 4.0 (5) Competitive Industry 4.0 (6) Innovation models (7) Appropriability regimes (8) Connecting value chains (9) Four cases of appropriability (10) Gains and losses (11) Your Industry 4.0 project (12) IP in the value chain (13) Managing IP for Industry 4.0 (14) Managing valuable assets (15) Protecting IP in value chains (16) A model to profit from Industry 4.0

The book shows how simulations long history and close ties to industry since the third industrial revolution have led to its growing importance in Industry 4.0. The book emphasises the role of simulation in the new industrial revolution, and its application as a key aspect of making Industry 4.0 a reality - and thus achieving the complete digitisation of manufacturing and business. It presents various perspectives on simulation and demonstrates its applications, from augmented or virtual reality to process engineering, and from quantum computing to intelligent management. Simulation for Industry 4.0 is a guide and milestone for the simulation community, as well as those readers working to achieve the goals of Industry 4.0. The connections between simulation and Industry 4.0 drawn here will be of interest not only to beginners, but also to practitioners and researchers as a point of departure in the subject, and as a guide for new lines of study.

The first part is devoted to digital automation platforms, including an introduction to Industry 4.0 and digital automation platforms The second part focuses on the presentation of digital simulation and functionalities The third part provides information about assets and services that boost the adoption of digital automation functionalities
Industry 5.0
Prospects for Industry 4.0
Industry 4.0
Past, Present, and Future
The Future of Productivity
Technologies and Trends of the Fourth Industrial Revolution

A large and growing number of manufacturers are realizing the substantial financial and environmental benefits of sustainable business practices. To develop more sustainable societies, industries need better understand how to respond to environmental, economic, and social challenges and transform industrial behavior. The objective of this book is to provide the required knowledge and accelerate the transition towards a sustainable industrial system. The book will help industries to enhance operational efficiency by reducing costs and waste. It will help them increase customer response, reach new customers, and gain competitive advantage. It offers innovation, scenario planning, and strategic analysis that goes beyond compliance, as well as case studies and remedies to the industry 4.0 challenges. Professionals, as well as students, can refer to this book to add to their knowledge on Industry 4.0 and develop new ideas and solutions to the existing and future problems.

Industry 4.0 is based on the cyber-physical transformation of processes, systems and methods applied in the manufacturing sector, and on its autonomous and decentralized operation. Industry 4.0 reflects that the industrial world is at the beginning of the so-called Fourth Industrial Revolution, characterized by a massive interconnection of assets and the integration of human operators with the manufacturing environment. In this regard, data analytics and, specifically, the artificial intelligence is the vehicular technology towards the next generation of smart factories.Chapters in this book cover a diversity of current and new developments in the use of artificial intelligence on the industrial sector seen from the fourth industrial revolution point of view, namely, cyber-physical applications, artificial intelligence technologies and tools, Industrial Internet of Things and data analytics. This book contains high-quality chapters containing original research results and literature review of exceptional merit. Thus, it is in the aim of the book to contribute to the literature of the topic in this regard and let the readers know current and new trends in the use of artificial intelligence for the Industry 4.0.

This open access book explores the concept of Industry 4.0, which presents a considerable challenge for the production and service sectors. While digitization initiatives are usually integrated into the central corporate strategy of larger companies, smaller firms often have problems putting Industry 4.0 paradigms into practice. Small and medium-sized enterprises (SMEs) possess neither the human nor financial resources to systematically investigate the potential and risks of introducing Industry 4.0. Addressing this obstacle, the international team of authors focuses on the development of smart manufacturing concepts, logistics solutions and managerial models specifically for SMEs. Aiming to provide methodological frameworks and pilot solutions for SMEs during their digital transformation, this innovative and timely book will be of great use to scholars researching technology management, digitization and small business, as well as practitioners within manufacturing companies.

Industry 4.0 is a European term that refers to the digital transformation in the industry, or also known as the Fourth Industrial Revolution. In the United States it is called Smart Factory, or Smart Factory. In the first part of the book, it is intended to explain carefully and in depth the new emerging technologies that come from computer engineering, electronics and telecommunications. Among others, industrial robotics, the internet of things, artificial intelligence, information systems such as Big Data, CIM, MRP and ERP, Blockchain or cybersecurity are detailed. In the second part of the book, techniques that come from mechanical engineering and industrial organization are developed. It explains about production management, quality, supply chain management and warehouse management. Finally, in the third part of the book, a series of tools from business administration are presented to give a global approach to the management of companies in the present and the future. The book gathers all the emerging technologies from the different fields of engineering and management so that the reader has a complete vision of how to adapt to the digital transformation of the industry without being left behind.

This book addresses a wide range of issues relating to the theoretical substantiation of the necessity of Industry 4.0, the development of the methodological tools for its analysis and evaluation, and practical solutions for effectively managing this process. It particularly focuses on solving the problem of optimizing the development of Industry 4.0 in the context of knowledge economy formation. The book presents the authors' approach to studying the process of Industry 4.0 formation in connection with knowledge economy, and approach that allows the process to be studied in connection with the existing socio-economic and technological conditions. As a result, the conclusions and recommendations could be applied to modern economic systems and do not require any further elaboration. The presented research is based on modern economic theory scientific and methodological tools, including the tools of the theory of economic cycles, the theory of games, and the institutional economic theory. Raising awareness of the problem of Industry 4.0 formation, the book is of interest to a wide audience, including not only specialists and experts with a detailed knowledge of the topic, but also scholars, lecturers, and undergraduates of various fields of economics.

Accelerate digital transformation with business optimization, AI, and Industry 4.0
Challenges, Trends, and Solutions in Management and Engineering
Simple Introduction For Non-Specialists: Industry 4 0 For Manufacturing
Selected papers from the Global Joint Conference on Industrial Engineering and Its Application Areas, GJCIE 2017, July 20–21, Vienna, Austria
Challenges and Remedies
Responsible Design, Implementation and Use of Information and Communication Technology

This book shows a vision of the present and future of Industry 4.0 and identifies and examines the most pressing research issue in Industry 4.O. Containing the contributions of leading researchers and academics, this book includes recent publications in key areas of interest, for example: a review on the Industry 4.0: What is the Industry 4.0, the pillars of Industry 4.0, current and future trends, technologies, taxonomy, and some case studies (A.U.T.O 4.0, stabilization of digitized process). This book also provides an essential tool in the process of migration to Industry 4.0. The book is suitable as a text for graduate students and professionals in the industrial sector and general engineering areas. The book is organized into two sections: 1. Reviews 2. Case Studies Industry 4.O is likely to play an important role in the future society. This book is a good reference on Industry 4.O and includes some case studies. Each chapter is written by expert researchers in the sector, and the topics are broad: from the concept or definition of Industry 4.O to a future society 5.0.

"Industry 4.O will disrupt and change how we produce, do business, and live our lives. Related to manufacturing, the way products are produced will change radically not only within a company but also across companies. So, like any other revolution, the fourth industrial revolution will also produce winners and losers. Occupations, companies, and industries will die whereas new ones will emerge. So, companies need to adapt properly to those new technologies in order not to be pushed out of business. This book makes a contribution to understand the developments related to Industry 4.O. Experienced and well-established authors came together to shed light on different but complementary topics to offer a holistic view on Industry 4.O. Here, the Industry 4.O ecosystem, implications of Industry 4.O on human workforce, technical challenges and application examples are addressed"--

Max Hoffmann describes the realization of a framework that enables autonomous decision-making in industrial manufacturing processes by means of multi-agent systems and the OPC UA meta-modeling standard. The integration of communication patterns and SOA with grown manufacturing systems enables an upgrade of legacy environments in terms of Industry 4.0 related technologies. The added value of the derived solutions are validated through an industrial use case and verified by the development of a demonstrator that includes elements of self-optimization through Machine Learning and communication with high-level planning systems such as ERP. About the Author: Dr.-Ing. Max Hoffmann is a scientific researcher at the Institute of Information Management in Mechanical Engineering, RWTH Aachen University, Germany, and leads the group "Industrial Big Data". His research emphasizes on production optimization by means of data integration through interoperability and communication standards for industrial manufacturing and integrated analysis by using Machine Learning and stream-based information processing.

Technology has created innovative new prospects for manufacturing industries with Industry 4.0 and has helped further the growth of the manufacturing sector. This book focuses on the next stage, which is Industry 5.O, and the steps in taking automation to that next level by increasing processes and operational efficiency, as well as reducing workforce size. Industry 5.0: The Future of the Industrial Economy discusses the integration of product, process, machine, software, and industrial robots in realizing Industry 5.0. It covers the dual integration of human intelligence with machine intelligence and reviews the results of making use of Industrial Internet of Things (IIoT) and Artificial Intelligence (AI). The creation of a new category of robots named Collaborative Robots (Cobots) specifically designed to speed up the manufacturing process and profitability is explored. This book also explores how to reduce waste in product design through the manufacturing process and offers more personalized and customized products for customers. Manufacturing, design, industrial, and mechanical engineers, as well as practicing professionals, will find this book of interest. Management executives, CIOs, CEOs, IT professionals, and academics will also find something of value in this book that takes Industry 4.0 to Industry 5.0 and beyond.

Delve into industrial digital transformation and learn how to implement modern business strategies powered by digital technologies as well as organization and cultural optimization Key FeaturesIdentify potential industry disruptors from various business domains and emerging technologiesLeverage existing resources to identify new avenues for generating digital revenueBoost digital transformation with cloud computing, big data, artificial intelligence (AI), and the Internet of Things (IoT)Book Description Digital transformation requires the ability to identify opportunities across industries and apply the right technologies and tools to achieve results. This book is divided into two parts with the first covering what digital transformation is and why it is important. The second part focuses on how digital transformation works. After an introduction to digital transformation, you will explore the transformation journey in logical steps and understand how to build business cases and create productivity benefit statements. Next, you'll delve into advanced topics relating to overcoming various challenges. Later, the book will take you through case studies in both private and public sector organizations. You'll explore private sector organizations such as industrial and hi-tech manufacturing in detail and get to grips with public sector organizations by learning how transformation can be achieved on a global scale and how the resident experience can be improved. In addition to this, you will understand the role of artificial intelligence, machine learning and deep learning in digital transformation. Finally, you'll discover how to create a playbook that can ensure success in digital transformation. By the end of this book, you'll be well-versed with industrial digital transformation and be able to apply your skills in the real world. What you will learnGet up to speed with digital transformation and its important aspectsExplore the skills that are needed to execute the transformationFocus on the concepts of Digital Thread and Digital TwinUnderstand how to leverage the ecosystem for successful transformationGet to grips with various case studies spanning industries in both private and public sectorsDiscover how to execute transformation at a global scaleFind out how AI delivers value in the transformation journeyWho this book is for This book is for IT leaders, digital strategy leaders, line-of-business leaders, solution architects, and IT business partners looking for digital transformation opportunities within their organizations. Professionals from service and management consulting firms will also find this book useful. Basic knowledge of enterprise IT and some intermediate knowledge of identifying digital revenue streams or internal transformation opportunities are required to get started with this book.
Industry 4.0 for SMEs
Principles, Effects and Challenges
Technologies and Management in the Digital Transformation of the Industry
The Digital Shopfloor - Industrial Automation in the Industry 4.0 Era

Manufacturing in Digital Industries

Industrial Engineering in the Industry 4.0 Era

Between the 18th and 19th centuries, Britain experienced massive leaps in technological, scientific, and economical advancement

Industrial Digital Transformation

Industry 4.0 and Regional Transformations

Current Status and Future Trends

Simulation for Industry 4. 0

The Road to Future Value in Manfuacturing

Create a powerful Industrial IoT infrastructure using Industry 4.0