# The Fourth Industrial Revolution Industry 4 0

The era of the fourth industrial revolution has fundamentally transformed the manufacturing landscape. Products are getting increasingly complex and customers expect a higher level of customization and quality. Manufacturing in the Era of 4th Industrial Revolution explores three technologies that are the building blocks of the next-generation advanced manufacturing.The first technology covered in Volume 1 is Additive Manufacturing (AM). AM has emerged as a very popular manufacturing process. The most common form of AM is referred to as 'three-dimensional (3D) printing'. Overall, the revolution of additive manufacturing has led to many opportunities in fabricating complex, customized, and novel products. As the number of printable materials increases and AM processes evolve, manufacturing capabilities for future engineering systems will expand rapidly, resulting in a completely new paradigm for solving a myriad of global problems.The second technology is industrial robots, which is covered in Volume 2 on Robotics. Traditionally, industrial robots have been used on mass production lines, where the same manufacturing operation is repeated many times. Recent advances in human-safe industrial robots present an opportunity for creating hybrid work cells, where humans and robots can collaborate in close physical proximities. This Cobots, or collaborative robots, has opened up to opportunity for humans and robots to work more closely together. Recent advances in artificial intelligence are striving to make industrial robots more agile, with the ability to adapt to changing environments and tasks. Additionally, recent advances in force and tactile sensing enable robots to be used in complex manufacturing tasks. These new capabilities are expanding the role of robotics in manufacturing operations and leading to significant growth in the industrial robotics area.The third technology covered in Volume 3 is augmented and virtual reality. Augmented and virtual reality (AR/VR) technologies are being leveraged by the manufacturing community to improve operations in a wide variety of ways. Traditional applications have included operator training and design visualization, with more recent applications including interactive design and manufacturing planning, human and robot interactions, ergonomic analysis, information and knowledge capture, and manufacturing simulation. The advent of low-cost solutions in these areas is accepted to accelerate the rate of adoption of these technologies in the manufacturing and related sectors.Consisting of chapters by leading experts in the world, Manufacturing in the Era of 4th Industrial Revolution provides a reference set for supporting graduate programs in the advanced manufacturing area.

This book offers a critical reflection on the meaning and expected impact of the fourth industrial revolution, and its implications for industrial policy. Industrial revolutions are considered not only in terms of technological progress, but also in the context of the changing relationship between market and production dynamics, and the social and political conditions enabling the development of new technologies. Industrial Policy for the Manufacturing Revolution aims to increase our capacity to anticipate and adapt to the forthcoming structural changes. A concrete illustration of this industrial policy is provided through an experience of its implementation at regional level.

This book applies cutting-edge economic analysis and social science to unpack the rich complexities and paradoxes of the Fourth Industrial Revolution. The book takes the reader on a bold, refreshing, and informative tour through its technological drivers, its profound impact on human ecosystems, and its potential for sustainable human development. The overarching message to the reader is that the Fourth Industrial Revolution is not merely something to be feared or survived; rather, this dramatic collision of technologies, disciplines, and ideas presents a magnificent opportunity for a generation of new pioneers to rewrite "accepted rules" and find new avenues to empower billions of people to thrive. This book will help readers to discern the difference between disruption and transformation. The reader will come away from this book with a deeply intuitive and highly contextual understanding of the core technological advances transforming the world as we know it. Beyond this, the reader will clearly appreciate the future impacts on our economies and social structures. Most importantly, the reader will receive an insightful and actionable set of guidelines to assist them in harnessing the Fourth Industrial Revolution so that both they and their communities may flourish. The authors do not primarily seek to make prescriptions for government policy, but rather to speak directly to people about what they can do for themselves, their families, and their communities to be future-proofed and ready to adapt to life in a rapidly evolving world ecosystem.

We are living in the middle of a Fourth Industrial Revolution, with new technology leading to dramatic shifts in everything from manufacturing to supply chain logistics. In a lively, developing field of academic, procurement is often neglected. Despite this, procurement plays a vital role, connecting the organization with its ecosystem. At a time of change and economic crisis, a new business model is called for, which this book aims to define. Based on the applications of Industry 4.0 concepts to procurement, this book describes Procurement 4.0 as a method and a set of tools, helping businesses to improve the value of their products, reduce waste, become more flexible, and address the business needs of the future. It will appeal to academics in the area, as well as practitioners.

We have never lived at a time of faster and more transformative technological and societal changes. It can be hard for executives to keep up with the developments and shifts. This book cuts through all of the hype and presents the key business trends anyone should be aware of now as they will shape businesses into the foreseeable future. Business Trends in Practice includes case studies across all industries, with companies such as: Tesla, Ocado, Netflix, Microsoft, Google, Alibaba, Rolls Royce, Mercedes Benz, Apple, and many more. Some of the key trends the author will examine include: The AI revolution Robots and business processes automation Remote working, working from home and new flexibility Social & environmental Responsibility Increased Diversity As part of Bernard Marr’s popular ‘In Practice’ series, Business Trends in Practice will help you identify the key business trends that will keep you one step ahead of the competition.

An up-to-date guide for using massive amounts of data and novel technologies to design, build, and maintain better systems engineering Systems Engineering in the Fourth Industrial Revolution: Big Data, Novel Technologies, and Modern Systems Engineering offers a guide to the recent changes in systems engineering prompted by the current challenging and innovative industrial environment called the Fourth Industrial Revolution—INDUSTRY 4.0. This book contains advanced models, innovative practices, and state-of-the-art research findings on systems engineering. The contributors, an international panel of experts on the topic, explore the key elements in systems engineering that have shifted towards data collection and analytics, available and used in the design and development of systems and also in the later life-cycle stages of use and retirement. The contributors address the issues in a system in which the system involves data in its operation, contrasting with earlier approaches in which data, models, and algorithms were less involved in the function of the system. The book covers a wide range of topics including five systems engineering domains: systems engineering and systems thinking; systems software and process engineering; the digital factory; reliability and maintainability modeling and analytics; and organizational aspects of systems engineering. This important resource: Presents new and advanced approaches, methodologies, and tools for designing, testing, deploying, and maintaining advanced complex systems Explores effective evidence-based risk management practices Describes an integrated approach to safety, reliability, and cyber security based on system theory Discusses entrepreneurship as a multidisciplinary system Emphasizes technical merits of systems engineering concepts by providing technical models Written for systems engineers, Systems Engineering in the Fourth Industrial Revolution offers an up-to-date resource that contains the best practices and most recent research on the topic of systems engineering.

In this book, a new approach to the Industry 4.0 revolution is given. New policies and challenges appear and education in robotics also needs to be adapted to this new era. Together with new factory conceptualization, novel applications introduce new paradigms and new solutions to old problems. The factory opens its walls and outdoor applications are solved with new robot morphologies and new sensors that were unthinkable before Industry 4.0 era. This book presents nine chapters that propose a new outlook for an unstoppable revolution in industrial robotics, from drones to software robots

The purpose of this book is to provide an overview of the new industrial revolution: the "Industry 4.0." Globalization and competitiveness are forcing companies to review and improve their production processes. Industry 4.0 is a revolution that involves many different sectors and is still evolving. It represents the integration of tools already used in the past (big data, cloud, robot, 3D printing, simulation, etc.) that are now connected to a smart network by transmitting digital data at high speeds. The implementation of a 4.0 system represents a huge change for companies, which are faced with big investments. The idea of the book is to present practices, challenges, and opportunities related to the Industry 4.0. This book is intended to be a useful resource for anyone who deals with this issue.

Communication between man and machine is vital to completing projects in the current day and age. Without this constant connectiveness as we enter an era of big data, project completion will result in utter failure. Agile Approaches for Successfully Managing and Executing Projects in the Fourth Industrial Revolution addresses changes wrought by Industry 4.0 and its effects on project management as well as adaptations and adjustments that will need to be made within project life cycles and project risk management. Highlighting such topics as agile planning, cloud projects, and organization structure, it is designed for project managers, executive management, students, and academicians.

The founder and executive chairman of the World Economic Forum on how the impending technological revolution will change our lives We are on the brink of the Fourth Industrial Revolution. And this one will be unlike any other in human history. Characterized by new technologies fusing the physical, digital and biological worlds, the Fourth Industrial Revolution will impact all disciplines, economies and industries - and it will do so at an unprecedented rate. World Economic Forum data predicts that by 2025 we will see: commercial use of nanomaterials 200 times stronger than steel and a million times thinner than human hair; the first transplant of a 3D-printed liver; 10% of all cars on US roads being driverless; and much more besides. In The Fourth Industrial Revolution, Schwab outlines the key technologies driving this revolution, discusses the major impacts on governments, businesses, civil society and individuals, and offers bold ideas for what can be done to shape a better future for all.

How can companies survive and prosper in the new economic age of the 4th Industrial Revolution? This book collects a variety of cases and quality management strategies for companies to put in place in the face of Industry 4.0. It argues that organizations that practice good quality management throughout the whole organization, and focus on satisfying their customers, employees and other stakeholders better than their competitors, are well equipped with the necessary capabilities to survive. It is a must read book for academicians, practitioners, managers and students interested in learning about the quality management philosophy, principles, tools and methods to be used in building a sustainable future where the challenges of the 4th Industrial Revolution — Industry 4.0 —are regarded and used as opportunities for survival and further growth.

According to Prof. D. Despommier, by the year 2050, nearly 80% of the earth's population will reside in urban centers. Furthermore, the human population will increase by about 3 billion people during the interim. New land will be needed to grow enough food to feed them. At present, throughout the world, over 80% of the land that is suitable for raising crops is in use. What can be done to avoid this impending disaster? One possible solution is indoor farming. However, not all crops can easily be moved in an indoor environment. Nevertheless, to secure the food supply, it is necessary to increase the automation level in agriculture significantly. This book intends to provide the reader with a comprehensive overview of the impact of the Fourth Industrial Revolution and automation examples in agriculture.

Today’s world is continually facing complex and life-threatening issues that are too difficult or even impossible to solve. These challenges have been titled “wicked” problems due to their radical and multifarious nature. Recently, there has been a focus on global cooperation and gathering creative and diverse methods from around the world to solve these issues. Accumulating research and information on these collective intelligence methods is vital in comprehending current international issues and what possible solutions are being developed through the use of global collaboration. The Handbook of Research on Using Global Collective Intelligence and Creativity to Solve Wicked Problems is a pivotal reference source that provides vital research on the collaboration between global communities in developing creative solutions for radical worldwide issues. While highlighting topics such as collaboration technologies, neuro-leadership, and sustainable global solutions, this publication explores diverse collections of problem-solving methods and applying them on a global scale. This book is ideally designed for scholars, researchers, students, policymakers, strategists, economists, and educators seeking current research on problem-solving methods using collective intelligence and creativity.

Disruptions are being caused in the workplace due to the development of advanced software technology and the speed at which these technological advancements are being produced. These disruptions could take diverse forms and affect various aspects of work and the lives of entities in the workplaces and families of the individual employees. Work and family are caught in the crossfire between technological disruptions and human adaptation. Hence, there is a need to assess the overall effect that the Fourth Industrial Revolution would have on work, employee work-family satisfaction, and employee well-being. Future of Work, Work-Family Satisfaction, and Employee Well-Being in the Fourth Industrial Revolution is a critical reference source that discusses practical solutions and strategies to manage challenges and address fears regarding the effect of the Fourth Industrial Revolution on the future of employment and the workforce. Featuring research on topics such as corporate governance, job satisfaction, and mental health, this book is ideally designed for human resource professionals, business managers, industry professionals, government officials, policymakers, corporate strategists, consultants, work-life balance experts, human resources software developers, business policy experts, academicians, researchers, and students.

This book offers a timely yet comprehensive snapshot of innovative research and developments in the area of manufacturing. It covers a wide range of manufacturing processes, such as cutting, coatings, and grinding, highlighting the advantages provided by the use of new materials and composites, as well as new methods and technologies. It discusses topics in energy generation and pollution prevention. It shows how computational methods and mathematical

models have been applied to solve a number of issues in both theoretical and applied research. Based on selected papers presented at the Grabchenko's International Conference on Advanced Manufacturing Processes (InterPartner-2019), held in Odessa, Ukraine on September 10-13, 2019, this book offers a timely overview and extensive information on trends and technologies in the area of manufacturing, mechanical and materials engineering. It is also intended to facilitate communication and collaboration between different groups working on similar topics, and to offer a bridge between academic and industrial researchers.

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.

In the context of the Fourth Industrial Revolution, a world of continuous alterations is glimpsed where science and technology are at the base of economic competitiveness and where innovation plays a strategic role in global competition, so that they are forced to cover a series of requirements to compete successfully in an increasingly globalized economy, including high investments in both education and research. Along these lines, the formation of mathematical learning is important because it is oriented towards the development of a set of skills with the aim of resolving situations of daily and professional lives. It focuses on the acquisition of employing the different ways of representing information in the form of models, constructions, and graphs to determine the best decision making. In this sense, it includes the mastery of the handling of numbers, measures, and structures to carry out the interpretation of operations and representations of a quantitative nature on personal and professional situations. For a society to favor innovation, the use of mathematical information is an essential condition that allows the development of creativity and analysis of information. Mathematics education plays a vital role in this development. Developing Mathematical Literacy in the Context of the Fourth Industrial Revolution studies the formation of mathematical abilities in the context of the Fourth Industrial Revolution regarding its development of both teaching and learning strategies, as well as the use of ICT and its use in the development of this discipline in students. It is important that teachers of any educational level reorient their teaching strategies and their role as educators. Therefore, the chapters discuss up-to-date and relevant information on teaching and didactic tasks in the subject of mathematics. This book highlights mathematical pedagogies, ICT in mathematics learning, teacher training, and classroom strategies for mathematics. It is intended for teachers, pedagogical advisors, business trainers, higher education staff, administrators, teacher educators, practitioners, stakeholders, researchers, academicians, and students interested in mathematical literacy in the fourth industrial revolution.

The Fourth Industrial RevolutionCurrency

Advances in technological innovations, automation, and the latest developments in artificial intelligence (AI) have revolutionized the nature of work and created a demand for a new set of skills to navigate the Fourth Industrial Revolution (Industry 4.0). Therefore, it is necessary to equip displaced workers with a new set of skills that are essential for conversion into technical or other functional areas of business. Human Capital Formation for the Fourth Industrial Revolution is an essential research publication that recognizes the need to revitalize human capital formation for graduate employability in Industry 4.0 and discusses new skills and competencies needed to cope with the challenges present within this industrial revolution. The book seeks to provide a basis for curriculum design in line with the advances in technological innovations, automation, and artificial intelligence to enhance current and future employment. Featuring an array of topics such as curriculum design, emotional intelligence, and healthcare, this book is ideal for human resource managers, development specialists, training officers, teachers, universities, practitioners, academicians, researchers, managers, policymakers, and students.

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.

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.

This open access collection examines how higher education responds to the demands of the automation economy and the fourth industrial revolution. Considering significant trends in how people are learning, coupled with the ways in which different higher education institutions and education stakeholders are implementing adaptations, it looks at new programs and technological advances that are changing how and why we teach and learn. The book addresses trends in liberal

arts integration of STEM innovations, the changing role of libraries in the digital age, global trends in youth mobility, and the development of lifelong learning programs. This is coupled with case study assessments of the various ways China, Singapore, South Africa and Costa Rica are preparing their populations for significant shifts in labour market demands – shifts that are already underway. Offering examples of new frameworks in which collaboration between government, industry, and higher education institutions can prevent lagging behind in this fast changing environment, this book is a key read for anyone wanting to understand how the world should respond to the radical technological shifts underway on the frontline of higher education.

This book is designed to provide insights into an understanding of the best practices and contemporary approaches to the identification, assessment, selection, and development of future leaders of an organization with a focus on executive and transition coaching as a development tool. A company's leadership pipeline is expected to deliver its next generation of leaders who are capable of leading now. It is evident that conventional leadership development practices are no longer adequate. Organizations need to incorporate the next-generation leadership competencies globally in order to address the development needs of their rising leaders. The current digital transformation that underpins the Fourth Industrial Revolution (also known as Industry 4.0) has ushered in a new business environment that is fast, open, and responsive, resulting in a number of organizational and leadership challenges. How do organizations develop the next generation of leaders to meet these challenges? This book is designed to provide insights into an understanding of the best practices and contemporary approaches to the identification, assessment, selection, and development of future leaders of an organization with a focus on executive and transition coaching as a development tool.

World-renowned economist Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, explains that we have an opportunity to shape the fourth industrial revolution, which will fundamentally alter how we live and work. Schwab argues that this revolution is different in scale, scope and complexity from any that have come before. Characterized by a range of new technologies that are fusing the physical, digital and biological worlds, the developments are affecting all disciplines, economies, industries and governments, and even challenging ideas about what it means to be human. Artificial intelligence is already all around us, from supercomputers, drones and virtual assistants to 3D printing, DNA sequencing, smart thermostats, wearable sensors and microchips smaller than a grain of sand. But this is just the beginning: nanomaterials 200 times stronger than steel and a million times thinner than a strand of hair and the first transplant of a 3D printed liver are already in development. Imagine "smart factories" in which global systems of manufacturing are coordinated virtually, or implantable mobile phones made of biosynthetic materials. The fourth industrial revolution, says Schwab, is more significant, and its ramifications more profound, than in any prior period of human history. He outlines the key technologies driving this revolution and discusses the major impacts expected on government, business, civil society and individuals. Schwab also offers bold ideas on how to harness these changes and shape a better future--one in which technology empowers people rather than replaces them; progress serves society rather than disrupts it; and in which innovators respect moral and ethical boundaries rather than cross them. We all have the opportunity to contribute to developing new frameworks that advance progress.

It is always hard to set manufacturing systems to produce large quantities of standardized parts. Controlling these mass production lines needs deep knowledge, hard experience, and the required related tools as well. The use of modern methods and techniques to produce a large quantity of products within productive manufacturing processes provides improvements in manufacturing costs and product quality. In order to serve these purposes, this book aims to reflect on the advanced manufacturing systems of different alloys in production with related components and automation technologies. Additionally, it focuses on mass production processes designed according to Industry 4.0 considering different kinds of quality and improvement works in mass production systems for high productive and sustainable manufacturing. This book may be interesting to researchers, industrial employees, or any other partners who work for better quality manufacturing at any stage of the mass production processes.

This book explores the core themes of the Fourth Industrial Revolution (4IR) highlighting the digital transformation that has been occurring in society and business. Representing an interface between technologies in the physical, digital and biological disciplines the book explores emerging technologies such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing. The findings of collaborative research studies on the potential impact of the 4IR on the labour markets, occupations, future workforce competencies and skills associated with eight industry sectors in Australia are reported. The sectors are: agriculture and mining; manufacturing and logistics; health, medical and nursing; education; retail; financial services; government services and tourism.

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 gathers papers from the 11th Construction Industry Development Board (cidb) Postgraduate Research Conference, held on 28–30 July 2019 in Johannesburg, South Africa. The conference provided an essential forum for reviewing and generating knowledge on Construction 4.0 and, consequently, highlighted processes and practices that allow us to deliver and operate built environment assets more effectively and efficiently by focusing on physical-to-digital and digital-to-physical transformation. The event addressed three broad themes: Industrial production (prefabrication, 3-D printing and assembly, offsite and advanced manufacturing); Cyber-physical systems (actuators, sensors, IoT, robots and cobots for repetitive and dangerous tasks, and drones for mapping, progress monitoring, safety and quality inspections, lifting, moving and positioning); and Technologies (digital ecosystems, digital platforms, BIM, video and laser scanning, AI and cloud computing, big data and data analytics, reality capture, blockchain, simulation, virtual and augmented reality, data standards and interoperability, and vertical and horizontal integration). Given its scope, the book will be of interest to all construction industry and architectural professionals who want to learn about cutting-edge technologies applied to construction

Discover how 25 powerful technology trends are transforming 21st century businesses How will the latest technologies transform your business? Future Tech Trends in Practice will give you the knowledge of today’s most important technology trends, and how to take full advantage of them to grow your business. The book presents25 real-world technology trends along with their potential contributions to organisational success. You’ll learn how to integrate existing advancements and plan for those that are on the way. In this book, best-selling

author, strategic business advisor, and respected futurist Bernard Marr explains the role of technology in providing innovative businesses solutions for companies of varying sizes and across different industries. He covers wide-ranging trends and provides an overview of how companies are using these new and emerging technologies in practice. You, too, can prepare your company for the potential and power of trending technology by examining these and other areas of innovation described in Future Tech Trends in Practice: Artificial intelligence, including machine and deep learning The Internet of Things and the rise of smart devices Self-driving cars and autonomous drones 3D printing and additive manufacturing Blockchain technology Genomics and gene editing Augmented, virtual and mixed reality When you understand the technology trends that are driving success, now and into the future, you'll be better positioned to address and solve problems within your organisation.

The Industrial Revolution, powered by oil and other fossil fuels, is spiraling into a dangerous endgame. The price of gas and food are climbing, unemployment remains high, the housing market has tanked, consumer and government debt is soaring, and the recovery is slowing. Facing the prospect of a second collapse of the global economy, humanity is desperate for a sustainable economic game plan to take us into the future. Here, Jeremy Rifkin explores how Internet technology and renewable energy are merging to create a powerful "Third Industrial Revolution." He asks us to imagine hundreds of millions of people producing their own green energy in their homes, offices, and factories, and sharing it with each other in an "energy internet," just like we now create and share information online. Rifkin describes how the five-pillars of the Third Industrial Revolution will create thousands of businesses, millions of jobs, and usher in a fundamental reordering of human relationships, from hierarchical to lateral power, that will impact the way we conduct commerce, govern society, educate our children, and engage in civic life. Rifkin's vision is already gaining traction in the international community. The European Union Parliament has issued a formal declaration calling for its implementation, and other nations in Asia, Africa, and the Americas, are quickly preparing their own initiatives for transitioning into the new economic paradigm. The Third Industrial Revolution is an insider's account of the next great economic era, including a look into the personalities and players — heads of state, global CEOs, social entrepreneurs, and NGOs — who are pioneering its implementation around the world.

The term “4th Industrial Revolution” has become commonplace, popping up in various media, but the public's understanding of the underlying technologies is often lagging the fast-pace of its related technological developments. This book is designed to bridge the gap which exists between the 4th industry-related technology boom and the general public's perception of it. The book introduces the content and applications of the related major technologies, such as the Internet of Things, blockchain, artificial intelligence, cloud computing, and big data – all considered essential for the development and operation of contemporary business models. It is written to minimize technical / engineering content in order to enhance the reader's ability to understand these topics. FEATURES: Introduces the content and applications of the related major technologies, such as the Internet of Things, blockchain, artificial intelligence, robotics, machine learning, cloud computing, big data, virtual reality, and more Provides interesting descriptions and applications of technical topics to enhance understanding Covers topics and trends that must be considered in modern business models

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 4.0. 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 4.0 is likely to play an important role in the future society. This book is a good reference on Industry 4.0 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 4.0 to a future society 5.0.

The Fourth Industrial Revolution, also known as Industry 4.0, refers to the industrial paradigm bringing together the digital and physical worlds through the cyber-physical Systems, enhanced by the Internet of Things aimed to increase the effectiveness of human-machine cooperation (HMC). This book deals with issues related to the challenges of Industry 4.0 that are faced by enterprises and universities. Contrary to most publications on the subject, it covers both technological and business aspects of these challenges and shows how strong they are intertwined, bringing new value to readers. The book also presents new findings that will guide enterprises through Industry 4.0. This book offers readers an in-depth discussion of important areas of enterprises’ activities in the context of Industry 4.0. The first area concerns human resources management; in particular, what new employee competencies will be needed on the labor market, how to use modern concepts (e.g. design thinking), and how to manage multi-national teams of employees. The second area is related to marketing and covers issues regarding customized products. The third area is devoted to technical aspects such as autonomous vehicles, Internet of Things (IoT), radio-frequency identification (RFID) systems, and Bluetooth Low Energy (BLE) technology. The fourth area concerns IT systems, including systems that support work and business management, strategic information systems, and cyber-physical systems. Aimed at researchers, academics, practitioners, and students, it will be of value to those in the fields of human resource management, marketing, organizational studies, and management of technology and innovation.

World Economic Forum Founder and Executive Chairman Klaus Schwab offers a practical companion and field guide to his previous book, The Fourth Industrial Revolution. Today, technology is changing everything--how we relate to one another, the way we work, how our economies and goverments function, and even what it means to be human. One need not look hard to see how the incredible advances in artificial intelligence, cryptocurrencies, biotechnologies, and the internet of things are transforming society in unprecedented ways. But the Fourth Industrial Revolution is just beginning, says Schwab. And at a time of such tremendous uncertainty and such rapid change, he argues it's our actions as individuals and leaders that will determine the trajectory our future will take. We all have a responsibility - as citizens, businesses, and institutions - to work with the current of progress, not against it, to build a future that is ethical, inclusive, sustainable and prosperous. Drawing on contributions from 200 top experts in fields ranging from machine learning to geoengineering to nanotechnology, to data ethics, Schwab equips readers with the practical tools to leverage the technologies of the future to leave the world better, safer, and more resilient than we found it.

Three industrial revolutions have been among the most seminal events in human history, and now we are in the fourth, Industry 4.0. 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.

The Emerging Business Models describes current issues that the business leaders and professionals are facing, as well as developments in digitalization. This book consisting of 10 chapters introduces the new technology trends and challenges that businesses today face. The authors cover several increasingly important new areas such as the Fourth Industrial Revolution, Internet of Things (IoT), financial technology (FinTech), social media, platform strategy, analytics, artificial intelligence (AI) and many other forces of disruption and innovation that shape

today's realities of the world.These digital transformations are taking place at an exponential rate. The speed of innovations and breakthroughs is disrupting the traditional businesses. A better understanding of the changing environment in the new economy can enable business professionals and leaders to recognize realities, embrace changes, and create new opportunities — locally and globally — in this inevitable digital age.

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

World-renowned economist Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, explains that we have an opportunity to shape the fourth industrial revolution, which will fundamentally alter how we live and work. Schwab argues that this revolution is different in scale, scope and complexity from any that have come before. Characterized by a range of new technologies that are fusing the physical, digital and biological worlds, the developments are affecting all disciplines, economies, industries and governments, and even challenging ideas about what it means to be human. Artificial intelligence is already all around us, from supercomputers, drones and virtual assistants to 3D printing, DNA sequencing, smart thermostats, wearable sensors and microchips smaller than a grain of sand. But this is just the beginning: nanomaterials 200 times stronger than steel and a million times thinner than a strand of hair and the first transplant of a 3D printed liver are already in development. Imagine “smart factories” in which global systems of manufacturing are coordinated virtually, or implantable mobile phones made of biosynthetic materials. The fourth industrial revolution, says Schwab, is more significant, and its ramifications more profound, than in any prior period of human history. He outlines the key technologies driving this revolution and discusses the major impacts expected on government, business, civil society and individuals. Schwab also offers bold ideas on how to harness these changes and shape a better future—one in which technology empowers people rather than replaces them; progress serves society rather than disrupts it; and in which innovators respect moral and ethical boundaries rather than cross them. We all have the opportunity to contribute to developing new frameworks that advance progress.

A pair of technology experts describe how humans will have to keep pace with machines in order to become prosperous in the future and identify strategies and policies for business and individuals to use to combine digital processing power with human ingenuity.