

The 4th industrial revolution: responding to the impact of artificial intelligence on business

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This book comes in a time when humanity experiences a new wave of radical changes in technologies and societies. These changes are encapsulated by the term “Fourth Industrial Revolution”, which consists of a combination of technologies and systems such as artificial intelligence, machine learning, 3D printing, the Internet of Things, virtual and augmented reality, Big Data and mobile networks. All these make what has been reviewed as fantastic yesterday as real by changing the ways of producing, exchanging and consuming materials, products and services.

Besides creating new opportunities, the emerging technologies will help to address some of the grand challenges of the humanity like global population growth, shortages of food, energy and water, as well as climate change. The World Economic Forum (WEF), Organization for Economic cooperation and Development (OECD) and the United nations (UN) are among the several organizations that are actively engaged in intergovernmental plans in the impact and rise of what has been termed the 4th Industrial Revolution. The 4th Industrial Revolution is promising as developments are expected in industrial processes, smart cities, connected homes, autonomous transportation, better health care, education and overall living standards of humans. At the same time, the 4th Industrial Revolution may have disruptive effects with the requirement of new skills, less dependency on human labor force with automation in work places and super-intelligent and

complex systems, which may bring new challenges for socio-economic adaptation. Therefore, understanding the potentials and impacts of these technologies is a must for all who aim to take a leading position in socio-economic development over coming years.

This book is designed to provide a point of view of business practitioners, about how progress in technology makes us change the way we need to think about the enterprise strategy and the need to cover the impact of artificial intelligence is likely to take place for new practices. Overall, the book discusses and describes a number of topics that explain how the Digital Economy has emerged and will continue to expand as a key enabler of the 4th Industrial Revolution. The book defines the 4th Industrial Revolution as the culmination of abovementioned emerging technologies. A unique collection of primary research case studies are presented throughout the book that will serve as a guide to help decision makers grasp the importance and applicability of these new technologies to their business sector. Hence, the book is also a practical tool that helps to systematize the available knowledge and experience for people who make managerial decisions that work with business models that use machines and artificial intelligence, advanced analytics, 3D printing, robotics and the Internet of Things.

The book consists of four distinct parts. In the first part, there is an illustration of the technological changes with the advent of intellectual systems, which are an integral part of the 4th Industrial Revolution. From the point of view of today's realities, the book underlines how technological changes will cause cultural changes and paradigm shift in the very essence

of business models that any individual and organization face in their everyday life. These changes and new technologies challenge the values and business proposals that for many years served as the basis for many entrepreneurs. Changing and forming new value structures with emerging intellectual technologies, the book emphasizes that it is necessary to create new innovative models. Thus, in the first section, the book offers new models of machine learning and artificial intelligence, as necessary tools for navigation in the era of intelligent systems.

The second part of the book focuses on the intelligent agents, who perform tasks such as learning, reasoning, negotiating and self-organizing. In this new technological era, machine learning and advanced neural networks learn the basics of agents and become intelligent agents themselves as well as multi-agent system components. In this part, the book also introduces the concept of advanced neural networks, which are the prevailing trends in machine learning, inspired by the biological neural networks as computing systems.

In the third part, the book focuses on the cross-cutting concerns emerging

due to the use of artificial intelligence. The impacts of using these technologies are discussed from four different perspectives, including impacts of architecture security; ethics and society; and climate change, population growth, resources and global energy growth.

In the fourth, and final, part, the book provides a series of real case studies demonstrating alternative uses of artificial intelligence in business and draws conclusions on how these technologies affect all spheres of human life. In this part, the book provides useful guidelines to help practitioners in developing roadmaps for the introduction and operation of artificial intelligence as a new phenomenon in the 4th Industrial Revolution.

Besides providing a background on emerging technologies and practical guidance for decision-makers to help them prepare for the changes, with this book, Skilton and Hovsepian shed light on the new business models and enterprise architectures emerging as businesses seek to build strategies across a variety of industry sectors including health, retail, energy, government, transport and finance. Therefore, the book becomes a valuable source of knowledge and

practical skills. Hypotheses and evidence presented in the book makes everyone to think that there is an increasing need for a new type of thinking and leadership that recognizes the problem of managing new types of automation that have occurred because of recent advances in technologies. The range of topics that shape the new Digital Economy is expected to continue in an ever expanding fashion as various new technologies become part of the extended connectivity of system and systems that constitute the 4th Industrial Revolution. Therefore, there is a continuous need to stay up-to-date with new technological advancements, the solutions provided by them as well as the ways of achieving successful outcomes. These are the keys to success in the new global social, economic and technological order.

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