

Preface

As a new industrial revolution, the term Industry 4.0 is one of the most popular topics among industry and academia in the world. Industry 4.0 plays a significant role in strategy to take the opportunities of digitalization of all stages of production and service systems. The fourth industrial revolution is realized by the combination of numerous physical and digital technologies such as artificial intelligence, cloud computing, adaptive robotics, augmented reality, additive manufacturing and Internet of Things (IoT). Regardless of the triggering technologies, the main purpose of industrial transformation is to increase the resource efficiency and productivity to increase the competitive power of the companies. The transformation era, which we are living in now, differs from the others in that it not only provides the change in main business processes but also reveals the concepts of smart and connected products by presenting service-driven business models.

In this context, this book is presented so as to provide a comprehensive guidance for Industry 4.0 applications. Therefore, this book not only introduces implementation aspects of Industry 4.0, but also proposes conceptual framework for Industry 4.0 with respect to its design principles. In addition, a maturity and readiness model is proposed so that the companies deciding to follow the path of digital transformation can evaluate themselves and overcome the problem of spotting the starting point. A technology roadmap is also presented to guide the managers of how to set the Industry 4.0 strategies, select the key technologies, determine the projects, construct the optimized project portfolio under risk and schedule the projects in planning horizon. Meanwhile, the reflections of digital transformation on engineering education and talent management are also discussed. Then, the book proceeds with key technological advances that form the pillars for Industry 4.0 and explores their potential technical and economic benefits via demonstrations with real-life applications.

We would like to thank all the authors for contributing to this book

- Sule Itir Satoglu, Istanbul Technical University
- Basar Oztaysi, Istanbul Technical University
- Sezi Cevik Onar, Istanbul Technical University

- Gokhan Ince, Istanbul Technical University
- Ihsan Kaya, Yildiz Technical University
- Erkan Isikli, Istanbul Technical University
- Gaye Karacay, Istanbul Technical University
- Burak Aydin, Silver Spring Networks
- Omer F. Beyca, Istanbul Technical University
- Mehmet Bulent Durmusoglu, Istanbul Technical University
- Seda Yanik, Istanbul Technical University
- Selcuk Cebi, Yildiz Technical University
- Gulsah Hancerliogullari, Istanbul Technical University
- Mehmet Serdar Kilinc, Oregon State University
- Mustafa Esengun, Istanbul Technical University
- Baris Bayram, Istanbul Technical University
- Ceren Oner, Istanbul Technical University
- Mahir Oner, Istanbul Technical University
- Beyzanur Cayir Ervural, Istanbul Technical University
- Bilal Ervural, Istanbul Technical University
- Peiman Alipour Sarvari, Istanbul Technical University
- Alperen Bal, Istanbul Technical University
- Aysenur Budak, Istanbul Technical University
- Cigdem Kadaifci, Istanbul Technical University
- Ibrahim Yazici, Istanbul Technical University
- Mahmut Sami Sivri, Istanbul Technical University
- Kartal Yagiz Akdil, Istanbul Technical University

We would also like to thank our colleague Ceren Salkin Oner for her support to prepare the final format of the book. And finally, we thank our families for their moral support and endless patience.

Istanbul
2017

Alp Ustundag
Emre Cevikcan



<http://www.springer.com/978-3-319-57869-9>

Industry 4.0: Managing The Digital Transformation

Ustundag, A.; Cevikcan, E.

2018, XVIII, 286 p. 30 illus., 23 illus. in color., Hardcover

ISBN: 978-3-319-57869-9