Industry 4.0 and Global Businesses

This page intentionally left blank

Industry 4.0 and Global Businesses: A Multidisciplinary Investigation

EDITED BY

ENIS YAKUT

Manisa Celal Bayar University, Turkey



United Kingdom - North America - Japan - India - Malaysia - China

Emerald Publishing Limited Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2022

Editorial matter and selection © 2022 Enis Yakut. Published under exclusive licence by Emerald Publishing Limited.

Individual chapters © 2022 the authors. Published under exclusive licence by Emerald Publishing Limited.

Reprints and permissions service

Contact: permissions@emeraldinsight.com

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN: 978-1-80117-327-8 (Print) ISBN: 978-1-80117-326-1 (Online) ISBN: 978-1-80117-328-5 (Epub)



ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.

INVESTOR IN PEOPLE

Certificate Number 1985 ISO 14001

Table of Contents

List of Figures	vii
List of Tables	ix
List of Contributors	xi
Acknowledgment	xiii
Chapter 1 Industry 4.0 and the New World of Work Deniz Dirik	1
Chapter 2 Decentralization of Finance and Global Businesses <i>Tuna Can Güleç and Selim Duramaz</i>	19
Chapter 3 Internet of Things and Big Data Analytics Sultan Nezihe Turhan	31
Chapter 4 Effects of Technological Innovations on Consumer Behavior: Marketing 4.0 Perspective Enis Yakut	55
Chapter 5 Industry 4.0 and B2B Websites as Global Marketplaces: A Content Analysis Ismail Metin and Ahmed Yusuf Sarihan	69
Chapter 6 Carbon Emission and Global Trade Sustainability Hakan Tunahan and Halil Şimdi	81
Chapter 7 From Commerce to E-Commerce and Social Commerce: How Global? How Local? <i>Ramazan Nacar and Kadir Ozdemir</i>	95

Chapter 8 Industry 4.0 and Applications in Manufacturing Industry	y 111
Muhammet Enes Akpinar	
Chapter 9 The Effects of COVID-19 Pandemic on International Trade and Production in the Age of Industry 4.0: New Evidence from European Countries <i>Ayberk Şeker</i>	n 125
Chapter 10 Internet of Things for Individuals with Disabilities Ayşe Dilşad Yakut	137
Chapter 11 The Impact of COVID-19 on Football Industry: Implications and Future Perspectives <i>Ümit Hasan Gözkonan, Selim Baha Yıldız and Erdi Bayram</i>	153
Chapter 12 Logistics 4.0 and Smart Supply Chain Management Askin Özdağoğlu and Sezai Bahar	163
References	185

Index

229

List of Figures

Figure 1.1.	Five Skills of Human Capital 4.0.	8
Figure 2.1.	The Potential Pathways of the Chain Structure.	22
Figure 2.2.	The Potential Pathways of Regulatory Response.	24
Figure 2.3.	The Potential Pathways of the Market Evolution.	25
Figure 2.4.	The Potential Pathways of the Revolution of the Financial Intermediation.	27
Figure 3.1.	The Estimated Increase in Digital Data Production over the Years.	36
Figure 4.1.	Key Elements of Internet of Things (IoT) Ecosystem.	60
Figure 6.1.	Responsiveness Scores Distribution (Model 1).	91
Figure 6.2.	Responsiveness Scores Distribution (Model 2).	92
Figure 7.1.	E-commerce Overview.	101
Figure 7.2.	E-commerce Adoption of Countries.	101
Figure 7.3.	E-commerce Sales Growth (Billion \$).	102
Figure 7.4.	Number of Social Media Users (Billion).	105
Figure 7.5.	Pre- and Post-Covid-19 Global e-commerce Revenue Change (Billion \$).	106
Figure 7.6.	Global e-commerce Growth by Category.	100
Figure 8.1.	Relationship Network Diagram.	107
Figure 9.1.	Gross Domestic Product (GDP) and Trade	141
1 iguit 7.1.	Share of Asian and European Countries.	128

Figure 11.1.	The Total Revenues of the Top 10 Clubs in	
	the Deloitte Football Money League.	155
Figure 12.1.	Integration Framework for the Development	
	of Digital Supply Chain.	178

List of Tables

Table 1.1.	Changing Fabric of Skills on Demand.	6
Table 1.2.	Jobs in High versus Low Demand.	7
Table 5.1.	B2B Websites Approved by the Turkish Ministry of Trade.	74
Table 5.2.	Sources of Criteria and Proposed Website Assessment Framework.	74
Table 5.3.	First Step Criteria's Findings.	76
Table 5.4.	Second Step Criteria's Findings.	77
Table 5.5.	Last Step Criteria's Findings.	78
Table 6.1.	Carbon Dioxide (CO ₂) Emission per Capita (Tonnes) Descriptive Statistics of Countries (1959–2018).	89
Table 6.2.	Carbon Dioxide (CO ₂) Emissions $log(t)$ Convergence Test Results.	90
Table 6.3.	Single Factor Responsiveness Scores (Model 1).	90
Table 6.4.	Single Factor Responsiveness Scores (Model 2).	92
Table 7.1.	Social Commerce Design Principles.	103
Table 8.1.	Binary Comparison Scale.	117
Table 8.2.	3D Printer Alternatives and Criteria.	119
Table 8.3.	Direct Relationship Matrix (Z) .	119
Table 8.4.	Normalized Direct Relationship Matrix (X).	120
Table 8.5.	Total Impact Matrix (T).	120
Table 8.6.	Importance and Relationship Matrix.	121
Table 8.7.	Initial Matrix for Analytical Hierarchy Process (AHP) Calculation.	122
Table 8.8.	Criterion Weights.	122

Table 8.9.	Initial Matrix for VIKOR Calculation.	123
Table 8.10.	S, R, and Q Values of VIKOR Method.	123
Table 9.1.	Cross-sectional Dependence Test Results.	133
Table 9.2.	Second-generation Panel Unit Root Test (PESCADF) Results.	134
Table 9.3.	Westerlund (2007) Panel Cointegration Results.	134
Table 9.4.	Dumitrescu and Hurlin (2012) Panel Causality Test Results.	135
Table 10.1.	Principles of Universal Design.	149
Table 11.1.	Impact of COVID-19 on Selected	
	European Football Leagues.	157
Table 12.1.	Literature about Logistics 4.0.	167
Table 12.2.	Literature about Smart/Digital Supply	
	Chain Management.	169
Table 12.3.	Historical Evolution of Logistics.	172

List of Contributors

Muhammet Enes Akpinar Sezai Bahar Erdi Bavram Deniz Dirik Selim Duramaz Ümit Hasan Gözkonan Tuna Can Güleç Ismail Metin Ramazan Nacar Askın Özdağoğlu Kadir Ozdemir Ahmed Yusuf Sarihan Ayberk Şeker Halil Simdi Hakan Tunahan Sultan Nezihe Turhan Ayşe Dilşad Yakut Enis Yakut Selim Baha Yıldız

Manisa Celal Bayar University, Turkey Bursa Technical University, Turkey Dokuz Eylül University, Turkey Şırnak University, Turkey Bandırma Onyedi Eylül University, Turkey Bursa Technical University, Turkey Sakarya University, Turkey Sakarya University, Turkey Galatasaray University, Turkey Ibn Haldun University, Turkey Manisa Celal Bayar University, Turkey Manisa Celal Bayar University, Turkey

This page intentionally left blank

Acknowledgment

First, I would like to thank the authors for their time and expertise. Without their contribution, this book would not be possible.

Second, I would like to thank the reviewers for their insightful comments to enhance the quality, coherence, and content delivery of the chapters. Most of the authors also served as referees; I greatly appreciate the burden that they voluntarily undertook. Specifically my special thanks go to the respected reviewers Selim Baha Yıldız (PhD), Tuna Can Güleç (PhD), İlayda İpek (PhD), Ayberk Şeker (PhD), İsmail Metin (PhD), Aşkın Özdağoğlu (PhD), Taner Taş (PhD), Esra Akgül (PhD), Selim Duramaz (PhD), Ebru Sürücü Balcı (PhD), and Özlem Yılmaz Metin.

Third, I would like to thank the editorial and production team at Emerald Publishing and their support from the beginning to the end.

Lastly, I am always grateful to my family for always being there and supporting me.

Enis Yakut