Editorial

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Biographical notes: Matteo Mario Savino obtained his PhD in Industrial Operations at the University of Naples, Italy. Actually, he is a Full Professor of Industrial Operations and Production Systems at the University of Sannio. He is the Head of the Centre on Production, Reliability and Industrial Management Engineering. His main research interests are related to quantitative approaches for quality and environmental management, production and supply chain management. He manages national industry-based and EU funded projects on operations management. He has been a guest editor of special issues on several peer reviewed international journals.

Marco Bortolini is an Associate Professor at the Department of Industrial Engineering of the University of Bologna, Italy. His scientific, teaching, research and technological transfer activities focus on the study and implementation of strategies, methods and innovative tools for the design, management, optimization and simulation of production systems, logistic activities and facility service plants from a multi-objective perspective. Deep attention is paid on the role and integration of the recent disruptive Industry 4.0 technologies on production and logistic systems to improve the technical, economic and sustainability performances of these complex systems. He is involved in local and international projects with companies and institutional stakeholders in the field of industrial systems' engineering, operations and logistics.

The purpose of this special issue has been to explore the recent advances in innovative strategies, models and tools for smart production/logistic design, management and optimisation within the challenging framework of the Industry 4.0. Industry 4.0 is the current paradigm of modern production and supply chain management.

Both manufacturing and assembly processes are required to be at the same time highly flexible, dynamic, customisable, reliable, sustainable and smart.

The guest editors acknowledge that enabling technologies and reconfigurable manufacturing systems to real-time dynamic simulation techniques ensure effective and high standards in production.

Achieving customers' value has increased also the role of reverse logistics (RL), essential in customers' satisfaction (Mushtaq et al., 2018). In SCM, a key role can be played by enabling technologies to support better integration of the information system and receive a faster response to customer demand. Many companies are investing in various technologies to facilitate and increase their performance. The dramatic improve of logistic and IT tools have inspired supply chain unit development which includes real time information, racking and automatic data collection. In this sense, radio frequency identification (RFID) is a cutting edge technology that in several cases offered the solution to this problem (Savino et al., 2018).

This special issue seeks to increase knowledge and develop some themes and concepts that may be useful both to organisations seeking to be informed about development of innovative tools and technologies for management and optimisation of production and supply chains within Industry 4.0, and researchers seeking real-time dynamic simulation techniques to improve capability on tracking, monitoring and performance analysis by web-based services (Menanno et al., 2019).

Innovative models and tools for production optimisation were raised in two papers, the first by Savino et al. (2020), in which a methodology to increase production capacity is implemented and the second by Menanno et al. (2021) regarding the implementation of machine learning and artificial intelligence techniques for manufacturing and assembly.

In seeking to achieve goals of further contribution to the body of knowledge in this under-researched area, the review process brought to seven high-quality contributions to theory and practice. An important overall finding is that multiple and diverse case study and theoretical perspectives may inform and increase knowledge on how smart technologies play a significant role in transforming production and business models into industrial status.

The research papers published in this special issue demonstrate the wide scope of theories, strategies, and tools that may be considered in the investigation on the developments of new technologies deriving from the implementation of Industry 4.0 within organisations. Developing countries have focused more on smart technologies and could achieve considerable industrial status in the near future. In addition, digitalisation technologies (DT) have been identified to reduce operating costs and environmental impact, maximising at the same time customer satisfaction in supply chain management. Although the authors of this special issue acknowledge that they have only explored a small number of the potential research avenues, each study provides strong evidences that smart production and logistic optimisation would benefit from further research.

References

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