Chapter 9
The Future of Manufacturing:
Integrating Digital Innovation and Integrated Frameworks

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ABSTRACT

This book chapter examines the revolutionary impact of digital transformation on the manufacturing industry, as well as future applications. The book chapter provides corporates, academicians, consultants, and researchers with an overview of integrated frameworks and cutting-edge digital innovations that helps in the transformation of manufacturing. This book chapter explains how technological advances are reshaping traditional manufacturing methods. The book chapter contains real-world case studies, in-depth analysis, and expert insights that are intended to help readers in navigating and leveraging the shift to a more efficient, sustainable, and streamlined manufacturing environment. Throughout the manufacturing value chain,

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automation is at the forefront of digital technological trends and innovation, which is why a growing number of companies are striving to enhance their operational and functional processes across their entire value chain in order to increase their operational and functional efficiency.

INTRODUCTION

Manufacturing companies are being forced to adapt to the new scenarios and processes for using digital technologies; this has caused a digital transformation as a result of the new processes for using digital technologies. Digital transformation, even though it is a highly relevant and recent theme in manufacturing, is being implemented in a design and study manner by manufacturing companies (Okano, M. T., Antunes, S. N., & Fernandes, M. E. 2021). There has been a great deal of digital transformation in the manufacturing industry, driving significant improvements in terms of quality control, efficiency, and product development, while at the same time reducing costs as well as improving environmental control. There is a global manufacturing revolution going on right now. Using the skills and strategies outlined in the Manufuture vision and the strategic agenda is a vital component of digital manufacturing (Westkämper, E. 2007). A significant part of this transformation is the integration of advanced technologies into manufacturing processes, such as the Internet of Things (IoT), artificial intelligence (AI), machine learning, and big data analytics based on big data.

Digital transformation has several significant benefits, and enhancing quality control is one of the most notable of these benefits. There are many manufacturing companies that have taken advantage of digital technologies to make rapid advances in their processes (Savastano, M., Amendola, C., & D'Ascenzo, F. 2018). Manufacturing companies can detect defects and inconsistencies early on in the production process by using real-time data and predictive analytics, which ensures that only the most high-quality products are shipped to the market at the end of the production process. Manufacturing companies that have made significant advances in their business by utilizing digital technologies to their advantage (Holmström, J., & Partanen, J. 2014). With this proactive approach to waste minimization, we are able to minimize costly rework and minimize waste.

Gaining efficiency is another important advantage to consider. Streamlining operations and optimizing resource utilization is possible with automated technologies and advanced analytics. Using the internet of things (IoT) devices in smart factories enables monitoring the performance of equipment in real time, predicting the need for maintenance, and preventing unplanned downtime. There are many benefits to this approach, including more efficient production cycles and maximum output.

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