Chapter 3
Examining Dimensions, Components, and Key Performance Indicators of Information Logistics in Industry 4.0

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ABSTRACT

The emerging technologies that drive the fourth industrial revolution rely on the knowledge and systems of previous industrial revolutions. The goal of the fourth industrial revolution is to develop more agile, responsive, and customer-oriented manufacturing industries. In this era, technologies with their potential to revolutionize the production of goods and services intend to revolutionize the global economy as well. The technologies of the fourth industrial revolution, beyond the effects they probably have on economic inequality, can have significant negative side effects on various fields. As business becomes more competitive and complicated at the international level, the need for managers to pay attention to technology-based strategies in the new era is a competitive advantage for companies. For this reason, an effort has been made in this chapter to identify and evaluate the most important dimensions, components, and key performance indicators in the field of information logistics and intelligent supply chain by emphasizing the literature on the subject.

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INTRODUCTION

Today, production is strongly influenced by global trends. Although uncertainty or change are the primary threats to business success, there is great potential in digitalization and Industry 4.0. The fourth industrial revolution creates a transformation in the way companies produce, improve and distribute products. Manufacturers are integrating new technologies including the Internet of Things (IoT), cloud computing and analytics, and artificial intelligence and machine learning into their manufacturing facilities and throughout their operations (Fallah et al., 2021). These smart factories are equipped with advanced sensors, embedded software and robotics that collect and analyze data and enable better decision making. Even greater value is created when data from manufacturing operations is combined with operational data from ERP, supply chain, customer service, and other enterprise systems to create entirely new levels of visibility and insight from previously stored information (Nahr et al., 2021).

Digital transformation is affecting almost every branch of every industry – from large-scale manufacturing and transportation to customer service and e-commerce. Packaged goods, retail, and manufacturing have seen some of the biggest transformations through advances in digital technology. There are many process areas we can look at to learn how to best take advantage of the benefits of digital transformation, one of the most important of which is supply chain management (Nozari & Szmelter-Jarosz, 2022). The symbiosis of the fourth industrial revolution and the supply chain has enabled businesses to take full advantage of the latest technologies in retail digital transformation – artificial intelligence, machine learning, predictive analytics, unified commerce and big data – and thereby supply chain management. Experience smart provision. Artificial intelligence, which includes machine learning and predictive analytics, helps supply chain business intelligence. These technology solutions use big data, logistics patterns and business trends to inform and optimize the entire digital supply chain (Nozari, Fallah, Kazemipoor et al, 2021). While aspects of the supply chain have historically been manual and imperfect, smart supply chain management greatly improves accuracy and visibility, and this is undoubtedly due to the connection between the fourth industrial revolution and the large-scale supply chain. This ecosystem will be based on the full implementation of a wide range of digital technologies – cloud, big data, Internet of Things, 3D printing, augmented reality and more. Together, these technologies are able to create new business models, digitize products and services, and digitize and integrate every link in the value chain of a business (Roman et al., 2023). In fact, in many companies, the supply chain is the business itself. The supply chain extends the vertical integration of all company functions in the horizontal dimension, tying the relevant players together through a network of sensors and social technologies