

Chapter 10

Leveraging Digital Data for Optimizing Supply Chain Performance

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ABSTRACT

The integration of advanced technologies into the various components of the supply chain is what makes up a digital supply chain. By harnessing the power of digital, companies gain valuable insights into the roles and relationships of each participant, leading to an evolution of the entire network. Today, digital is an integral part of modern supply networks and industries. In this chapter, the authors dive into the world of digital supply chains and explore how advanced technologies are shaping the logistics industry. They examine the evolution of supply chain digitalisation and its importance to modern businesses. They also look at the role of data analytics and its impact on improving supply chain performance. Finally, they present the application of a selected data analysis method to the database of the logistics department of an international industrial company to better understand its current state.

INTRODUCTION

To be successful in business, large organizations need to manage their supply chains as well as they can. In fact, the supply chain is the series of events and steps that occur between a company or organization and its employees or partners to acquire

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raw materials or inputs that are used to make finished or semi-finished products. It can also be defined as the links between producers and consumers that ensure the right products get to the right people, at the right time and under the right conditions. This can involve a wide range of activities, from sourcing raw materials to processing them into finished products and packaging them for sale (Ramzan et al., 2021).

Recently, a new concept has emerged to support and evolve the traditional supply chain: the Digital Supply Chain (DSC). This phenomenon consists of an inventory, order and delivery management system that uses technology to streamline processes and increase efficiency. The term DSC comes from the idea that companies need to be able to combine data, AI, and software to add value and look to the future and the business of tomorrow (Ghadge et al., 2020). DSC was first introduced in the 1970s with the advanced automation of production using electronics, computers, and industrial robotics. It then evolved, especially from the 1990s onwards, to include information systems and the use of digital technology (Lee et al., 2022).

The digital supply chain has brought many benefits to companies. It has increased company profits by reducing the costs associated with inventory management and shipping (Amri Sakhri et al., 2022). It has also saved companies time by eliminating the need to manage outdated information about the availability or location of their product at any given time, thus avoiding lost sales or overstocking. DSC is also more accurate because it tracks inventory at every stage of its lifecycle, from the time it enters the system to the time it leaves, and uses real-time data to make adjustments as needed (Lee et al., 2022).

Digitalization is a major advantage for companies to control their data flows and encourages the use of innovative methods to collect, transform and analyze data from different sources. An increasing number of industries are using digital technology to harness their industrial data, analyze it, identify strengths and weaknesses in their supply chain and take appropriate action. These can now be found in the pharmaceutical, manufacturing, food, chemical, engineering, and automotive sectors (Kumar et al., 2022; Lee et al., 2022; Peng et al., 2022). These companies use these practices to gain a deeper understanding of their internal and external environments, enabling them to adapt quickly to changing market dynamics. Our research is driven by a desire to apply data-driven techniques to identify and solve supply chain problems. This new approach to data analysis harnesses the power of technology to identify and address challenges across a wide range of industries. We want to apply it to show how it can be used from the implementation of different technological systems capable of collecting and processing data, to transform the data into relevant information capable of avoiding problems such as waste in industries.

In this article, we aim to explore the evolution of supply chain digitalization and highlight its centrality to today's businesses. We will study the profound impact of data analytics on improving supply chain efficiency. Our exploration will encompass

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