Chapter 16
The Role of Supply Chain Control Towers in Facilitating Sustainable Supply Chain Management Practices

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ABSTRACT

Sustainable supply chain management (SSCM) has become a critical consideration for businesses across various industries, driven by customer demand, pressure from interest groups, potential cost savings, enhanced reputation, and brand recognition. However, despite the benefits of implementing SSCM practices, the implementation process can be challenging and costly. A supply chain control tower (SCCT) is a critical technology for achieving collaboration among supply chain participants and providing real-time visibility across the end-to-end supply chain operations. In this book chapter, the authors undertake a literature review to explore the potential of supply chain control towers to support the adoption of SSCM and overcome associated challenges while highlighting potential sustainability gains. The aim is to identify the benefits of using supply chain control towers to facilitate sustainable practices and provide recommendations for organizations to maximize the benefits of control towers in enhancing sustainability performance.

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INTRODUCTION AND BACKGROUND

Modern supply chains increasingly recognize sustainable practices as vital elements for success and competitiveness (Zimon et al., 2019). A Sustainable Supply Chain (SSC) refers to the end-to-end management of supply chain activities, comprising sourcing, transformation, and distribution, as well as various flows of materials, funds, and information. The key emphasis of SSC is the triple bottom line, which comprises three pillars: people, the planet, and profit (Govindan & Hasanagic, 2018; Zhu et al., 2019). As Villena and Gioia (2020) highlight in their Harvard Business Review article, SSC aims to limit negative impacts on the environment and society while pursuing economic gains.

Embracing SSC practices can provide a multitude of benefits to organisations. For instance, SSC can improve operational efficiency by reducing waste and optimising the use of resources, which can lead to cost savings. In addition, by showing interest in sustainability, organisations can improve their brand image and reputation (World Economic Forum, 2022). Moreover, the UN Global Impact suggests that SSC practices can promote labor rights, anti-corruption standards, responsible environmental practices, and fair work conditions (Househam, 2017).

According to the World Economic Forum (2022), global organisations have received increasing attention in promoting sustainable supply chain practices. This upward trend is predominately driven by pressure from a variety of stakeholders, including consumers, business investors, and governmental authorities, reshaping SSC as a mandate rather than a voluntary option. To apply SSC principles, organisations should set targets, prepare and implement plans, and measure progress towards achieving predetermined targets (Villena & Gioia, 2020). However, implementing SSC practices usually involves challenges, such as limited supply chain visibility, lack of technology, and inadequate planning (Rae, 2022).

This is where the idea of the Supply Chain Control Tower (SCCT) software becomes important. SCCT, an interconnected, cloud-based dashboard of data, activities, and analytics, uses artificial intelligence (AI), machine learning, and the Internet of Things (IoT) to manage and control the entire supply chain(Dwiyana et al., 2022). SCCT provides real-time visibility from suppliers to consumers, enabling supply chains to handle potential-disruptions, avoid service failures, optimize overall performance, manage risks, and standardize operations across various locations (Dwiyana et al., 2022, (IBM, n.d.; SAP, n.d.) Given the extensive benefits and capabilities of SCCTs, they present promising potential for fostering the implementation of sustainable supply chain practices.

Walmart, an American retailer, has successfully incorporated sustainable practices into its extended supply chain by the help of SCCT. Walmart uses a software called retail link to collect and analyze and share real-time supply chain data with partners (WSJ, 2023) This has led to reduced carbon emissions and more efficient transportation and waste removal. In 2020, Walmart managed to minimise carbon emissions by 1.2 metric tons, which is equivalent to taking 250,000 cars off the roads, aligning to its goal of reaching the level of zero emissions by 2040 (Walmart, 2022). Similarly, Nike, a global apparel industry leader, has employed SCCT to optimize its supply chain and implement sustainable practices. The system has supported Nike's efforts to reduce inventory, optimize demand forecasting, and decrease packaging needs, thereby enabling the organisation to move towards a closed-loop supply chain model (Future World, 2022). Despite these promising examples, the application of SSC is challenging. According to Gartner (2022), Implementing supply chain control towers (SCCTs) faces challenges such as unrealistic expectations, difficulties in breaking down functional silos, data ownership concerns, a shortage of skilled personnel, and the need for informed decision-making amidst numerous technology providers. Overcoming these obstacles requires clear guidelines, organisational alignment, and effective

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