


Chapter 14


The Impact of Cross–Border Logistics and E–Commerce on Sustainable Supply Chain Management in the Digital Age

Nidhi Priya

 <https://orcid.org/0009-0007-8859-5609>

University of Muhammadiyah Malang, Indonesia

Ilyas Mas'udin

 <https://orcid.org/0000-0002-0153-4560>

Universitas Muhammadiyah Malang, Indonesia

Fien Zulfikarijah

Universitas Muhammadiyah Malang, Indonesia

ABSTRACT

This chapter explores the dynamic interplay between cross-border logistics and e-commerce in shaping sustainable supply chain management (SCM) in the digital age. It focuses on how digital technologies, including AI, blockchain, and big data analytics, are transforming global logistics systems and e-commerce environments. These innovations boost operational efficiency, minimize carbon emissions, and enhance supply chain visibility. The chapter also examines green logistics initiatives, including electric vehicles and eco-friendly packaging, and addresses key challenges like regulatory hurdles, cybersecurity risks, and the complexities of last-mile delivery. Real-world case studies, such as DHL's GoGreen initiative and SMEs leveraging digital tools, provide actionable insights for integrating sustainability into e-commerce logistics. By presenting strategies for businesses, policymakers, and researchers, the chapter underscores the importance of collaboration and innovation in aligning global trade with environmental and social responsibilities in a connected world.

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1. INTRODUCTION

Cross-border logistics and e-commerce have revolutionized global trade, enabling businesses to reach new markets and consumers to access diverse products effortlessly. The integration of these systems is pivotal in shaping Sustainable Supply Chain Management (SSCM), especially in the digital age where environmental, economic, and social sustainability are critical. This chapter delves into the dynamics of cross-border logistics and e-commerce, highlighting their role in advancing sustainable practices. Cross-border e-commerce is steadily emerging as a primary method of conducting trade. The effective management of cross-border logistics has become a crucial element influencing the quality of cross-border e-commerce transactions due to its attributes of efficiency, quality, and cost-effectiveness. (Guan, Shuai, 2021).

Cross-border logistics entails the strategy, organization, and implementation of transporting goods across national boundaries. Present day logistics makes full use of internet of things generation and this IoT makes Global Trade easier and helps us in Cross Border Operations (Guan, Shuai, 2021). This segment of the topic highlights:

- Global Trade Dynamics: Overseeing international shipments, customs procedures, regulations, and trade agreements.
- Challenges: Managing delays, tariffs, cultural variations, and intricate documentation demands.
- Opportunities: Utilizing digital solutions for increased visibility, automation, and effectiveness in global transportation.
- Regarding sustainability, cross-border logistics must tackle:
 - Carbon emissions resulting from long-distance transportation (air, sea, or land).
 - Optimizing packaging to minimize waste and reduce transportation expenses.
 - Adhering to international environmental regulations.

E-commerce involves the online purchase and sale of goods or services. Cross-border e-commerce trade opens up opportunities for the advancement of international logistics (He, Wu, Choi, 2021). It has experienced significant growth in the digital era and is transforming supply chain practices:

- Immediate Satisfaction: Consumers expect quicker delivery and convenience, which encourages innovations such as same-day shipping and enhanced tracking systems.
- Growth Potential: E-commerce enables companies to access international markets with minimal physical infrastructure.
- Obstacles: Managing returns (reverse logistics), adjusting to changing demand, and increasing delivery frequency (last-mile logistics) present challenges.
- Regarding sustainability, e-commerce poses both problems and opportunities:
 - The rise in packaging waste and transportation emissions resulting from increased delivery volumes.
 - Possibilities to adopt environmentally friendly packaging, electric vehicles (EVs), and centralized distribution strategies.

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