

# E-Commerce and its Impact on Supply Chain: An Analysis in Apparel Manufacturing

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## Abstract

E-commerce is essential to supply chain management in addition to online purchasing and selling. Companies that manufacture clothing are having a terrible problem getting materials in a timely way. As a result of the weak supply chain, owners must pay extra for airing items. One of the most important parts of e-commerce is the supply chain management system (SCM). Having the correct product at the right place at the right time, lowering costs, and improving cash usage are all examples of supply chain efficiency. In order to maintain electronic records and prevent data breaches, e-commerce is essential to inventory management. In this study, we have designed a database management system that the partners in the garment supply chain can visualize centrally. This established database system allows buyers to submit orders electronically, perhaps saving money on ordering.

**Keywords:** Supply chain, E-commerce, Cost Reduction, Better Communication, Apparel Organization, Information Visibility

## Introduction

E-commerce extends beyond mere online trading or shopping; it plays a critical role in optimizing business processes across various operational levels. In the apparel manufacturing sector, organizations face mounting pressures to remain competitive amidst rising labor costs and regulatory demands. For instance, in Bangladesh, a governmental mandate requires wage increments in the garment industry every five years, with recent adjustments setting a 51% wage increase for workers. Such policies, while beneficial for labor standards, substantially raise manufacturing costs without additional subsidies or tax incentives to alleviate the financial burden on manufacturers.

Despite these cost pressures, apparel manufacturers often lack access to reliable electricity and gas supplies from the national grid, forcing many to invest in costly alternative energy sources. Consequently, apparel manufacturers are increasingly focusing on operational cost reduction strategies. A key area of focus is optimizing the supply chain to minimize costs and enhance ef-

iciency. Inefficiencies in supply chain management, particularly inadequate information visibility, often necessitate costly air shipments, increasing overall expenses. Integrating e-commerce within the supply chain can enhance visibility, streamline processes, and reduce operational costs.

## Literature Review

The apparel supply chain in Bangladesh faces unique challenges due to political and bureaucratic obstacles. Effective supply chain management (SCM) is crucial as it coordinates, schedules, and controls the procurement, production, inventory, and delivery processes, ensuring timely product availability at minimal costs. SCM is a critical aspect of e-commerce, allowing for better cost management and resource allocation.

Ganeshan and Harrison describe SCM as a network that includes procurement, transformation, and distribution processes to deliver end products to customers [1]. According to Lee & Corey, SCM encompasses the integration of activities across a network

of facilities, managing raw materials and distributing final products to customers [2]. Christopher expands on this definition by describing SCM as a network of organizations with upstream and downstream linkages involved in creating value for the end customer. Effective SCM strategically aligns business functions to enhance the long-term performance of individual companies and the overall supply chain [3, 4].

The separation of supply chain activities across companies enables specialization and economies of scale but introduces issues that require robust coordination to optimize the supply chain's performance [5]. Strategic supply chain management, known as best-value supply chains, prioritizes speed, quality, cost, and flexibility. As businesses increasingly operate within a global economy, supply chain management has evolved from focusing solely on cost reduction and quality improvement to incorporating agility, adaptability, and technological integration [6-8]. Zhang Shensheng notes the importance of agility within e-business software, emphasizing that flexibility is critical in adapting to the fast-paced nature of e-commerce [9].

**Problem Statement**

The central issue in integrating apparel supply chains with e-commerce is fostering trustworthy and collaborative relationships among chain partners. High commitment levels from all parties are necessary to maximize the benefits of the proposed system.

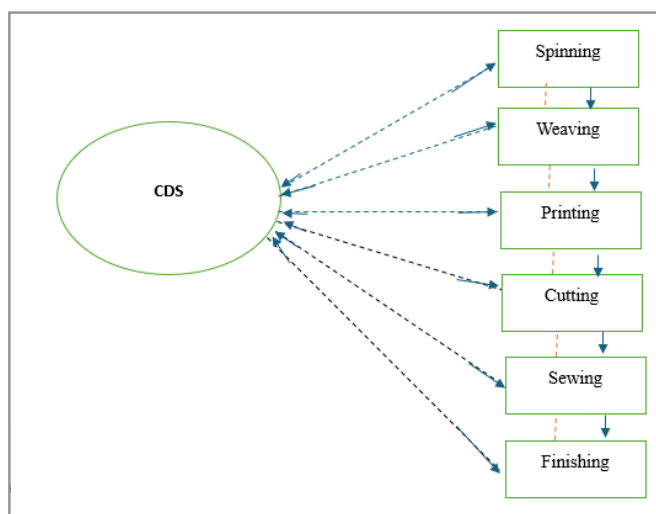
**Research Objectives**

- To examine the role of supply chain management within e-commerce in the apparel sector.
- To design a networked supply chain model tailored for apparel manufacturing.
- To develop a database management system to streamline online order placements and improve information accessibility.

**Research Methodology**

This research will commence with an in-depth study of both apparel supply chain dynamics and e-commerce integration. The primary focus will be identifying the specific roles and challenges the apparel supply chain encounters within an e-commerce framework. Given that e-commerce presents unique integration challenges, a tailored supply chain model will be developed for apparel manufacturing.

The final phase will involve developing a database management system to facilitate seamless online ordering. This system will link customers, manufacturers, and suppliers, creating a transparent order-to-delivery process. Mutual collaboration will be fostered through a shared database, ensuring that manufacturers can promptly respond to orders, while suppliers receive real-time updates on material requirements as orders are confirmed.



**Figure 1:** Apparel supply chain



**Figure 2:** Central Database System

Figure 3: Database System for Buyer

Figure 4: Database system for supplier

Figure 5: Database System for Manufacturer

Central Database System(CDS)

Buyer							Supplier							Manufacturer							
Name	Age	Sex	City	Priority	Reg No.	Order	Name	Priority	Fabric	Thread	Color	Button	Color	Reg No.	Fabric	Thread	Color	Button	Color	Reg No.	

Figure 6: CDS

## Conclusions and Recommendations

The proposed system envisions a centralized database that will enable apparel chain members to place orders efficiently. Using WordPress or a similar database management tool, this system will centralize order data, accessible to all members, and streamline communication and order fulfillment. Currently, orders are placed via email; however, this model introduces an online platform that centralizes order data, enabling smoother transactions and improved supply chain collaboration.

Future recommendations include expanding this database system into a comprehensive website for online order placements, which would further streamline processes and enhance operational efficiency in the apparel supply chain.

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