A Study on ERP / SAP Enabled Supply Chain Coordination in Retail and E-Commerce Industry

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Abstract

The retail and e-commerce industry operates in a highly dynamic environment characterized by high transaction volumes, multi-location inventory, rapid order-fulfilment expectations, frequent returns, and increasing customer demand for speed and service visibility. In such a context, effective supply chain coordination is critical for inventory availability, order accuracy, warehouse efficiency, logistics synchronization, and customer satisfaction. Enterprise Resource Planning (ERP) and SAP-enabled systems are increasingly used to integrate procurement, inventory, warehousing, logistics, order processing, and information flow across departments. The present study examines the role of ERP/SAP-enabled systems in improving supply chain coordination in the retail and e-commerce industry. The study is based on both primary and secondary data. Primary data were collected through a structured questionnaire from 122 respondents associated with procurement, inventory, warehouse, logistics, supply chain, and ERP-related functions in retail and e-commerce organizations. A descriptive research design and percentage-based analysis were used for interpretation. The findings indicate that ERP/SAP-enabled systems have a generally positive impact on supply chain coordination. A substantial proportion of respondents reported that ERP/SAP is either fully or partially implemented in their organizations, with warehouse management and order processing emerging as the most common application areas. The study further reveals that ERP/SAP contributes positively to interdepartmental coordination, operational decision-making, supplier coordination, dispatch support, and customer order tracking. At the same time, implementation challenges such as training and skill gaps, resistance to change, and system integration complexity continue to affect the extent of benefits realized. The study concludes that ERP/SAP-enabled systems function as important strategic and operational tools for improving supply chain coordination in the retail and e-commerce industry, provided that organizations invest in proper training, deeper integration, and disciplined system usage.

1. Introduction

The retail and e-commerce industry has undergone major transformation in recent years due to digitalization, increasing internet penetration, smartphone usage, omnichannel buying behaviour, quick-commerce models, and rising customer expectations regarding product availability, delivery speed, and service transparency. In this environment, supply chain coordination has emerged as one of the most critical determinants of business performance. Retail and e-commerce organizations are required to coordinate procurement, inventory planning, warehousing, order processing, dispatch, transportation, delivery, and returns management in a synchronized manner. A lack of coordination among these functions may result in stock-outs, order inaccuracies, delayed deliveries, increased operating costs, and poor customer satisfaction.

Enterprise Resource Planning (ERP) systems and SAP-enabled platforms are increasingly being adopted to address such coordination challenges. ERP refers to an integrated software system that connects multiple business functions through a common database and shared process structure. SAP, one of the most widely used ERP platforms globally, provides functional modules for procurement, inventory, warehouse management, logistics, sales, finance, and reporting. In the context of retail and e-commerce, ERP/SAP systems are expected to improve real-time visibility, standardize workflows, reduce manual errors, strengthen communication between departments, and support faster operational decision-making.

The present study seeks to examine the role of ERP/SAP-enabled systems in improving supply chain coordination in the retail and e-commerce sector. The study focuses on the impact of ERP/SAP on procurement coordination, inventory visibility, warehouse operations, order processing, logistics synchronization, and customer order tracking. It also examines the major benefits and implementation challenges associated with ERP/SAP usage in supply chain operations.

2. Review of Literature

Davenport (1998) described enterprise systems as organizational backbones that integrate business processes and create a unified information architecture across departments. Klaus, Rosemann, and Gable (2000) defined ERP as a packaged business software system that integrates the majority of an organization's processes through a common database and standardized workflows. Akkermans, Bogerd, and van Doremalen (2003) linked ERP implementation with supply chain management and argued that ERP systems support planning, coordination, and information consistency across procurement, inventory, and order-fulfilment processes.

Gunasekaran and Ngai (2004) emphasized the role of information systems in supply chain integration and management. Rai, Patnayakuni, and Seth (2006) examined the relationship between information sharing, process integration, and supply chain performance. Hendricks, Singhal, and Stratman (2007) concluded that ERP systems can improve operational performance when implementation quality, training, and organizational readiness are strong. Madapusi and D'Souza (2012) found that ERP contributes to operational performance by improving visibility, consistency, and transaction accuracy, particularly in high-volume environments.

Although prior research has discussed ERP, enterprise integration, and supply chain management extensively, a focused study on ERP/SAP-enabled supply chain coordination in the retail and e-commerce industry remains limited. Retail and e-commerce operations present unique challenges such as multi-location inventory, omnichannel demand, short order cycles, high return rates, and fast fulfilment pressure. Therefore, there is a practical need to examine ERP/SAP specifically in this context.

3. Research Gap

Much of the existing literature is either general in nature or focused on manufacturing settings. There remains a need for sector-specific empirical work on ERP/SAP-enabled coordination in retail and e-commerce operations, particularly from the perspective of employees involved in supply chain functions. The present study addresses this gap by analysing ERP/SAP through variables such as inventory visibility, warehouse coordination, order processing, supplier coordination, dispatch planning, and overall supply chain effectiveness.

4. Objectives of the Study

Primary Objective:
To study the impact of ERP/SAP-enabled systems on supply chain coordination in the retail and e-commerce industry.

Secondary Objectives:
1. To understand the role of ERP/SAP in procurement, inventory, warehouse, and logistics coordination.
2. To examine the effect of ERP/SAP on real-time information flow and operational decision-making.
3. To identify the major benefits of ERP/SAP adoption in retail and e-commerce supply chains.
4. To study the challenges faced during ERP/SAP implementation and usage.
5. To assess the overall perception of respondents regarding ERP/SAP and supply chain performance.

5. Hypotheses of the Study

H1: ERP/SAP adoption has a significant positive impact on supply chain coordination in the retail and e-commerce industry.
H2: ERP/SAP usage has a significant positive relationship with inventory/order visibility in the retail and e-commerce industry.
H3: ERP/SAP usage has a significant positive effect on operational decision-making in the retail and e-commerce industry.

6. Research Methodology

The present study is descriptive and quantitative in nature and is based on both primary and secondary data. Primary data were collected through a structured questionnaire from 122 respondents associated with procurement, inventory, warehouse, logistics, supply chain, operations, and ERP-related functions in the retail and e-commerce sector. Secondary data were collected from books, research articles, journals, websites, and industry resources related to ERP, SAP, supply chain management, retail operations, and e-commerce logistics.

A descriptive research design was adopted because the study aims to describe the opinions, perceptions, and observed operational effects of ERP/SAP among respondents. The study used convenience sampling because respondents were selected based on accessibility and relevance to the topic. The population consists of employees, executives, and professionals associated with the retail and e-commerce industry, especially those working in procurement, inventory, warehouse, logistics, operations, supply chain, and ERP-related functions. Percentage analysis, tabular presentation, and interpretative discussion were used for analysis.

7. Results and Discussion

The respondent profile indicates that the sample is operationally relevant to the study. The respondents were associated with functions directly linked to supply chain coordination, including procurement/inventory, warehouse/fulfilment, logistics/transportation, supply chain/operations, and IT/ERP support. The largest share of respondents belonged to procurement/inventory and warehouse/fulfilment roles, which is appropriate for evaluating ERP/SAP's operational impact on supply chain coordination.

The analysis indicates that ERP/SAP adoption is already significant in the retail and e-commerce environment. However, a major share of respondents reported that ERP/SAP is only partially implemented in their organizations, suggesting that implementation maturity is still evolving across firms. The study shows that ERP/SAP is most widely used in warehouse management and order processing & fulfilment, indicating a strong presence in execution-oriented supply chain activities.

The findings suggest that ERP/SAP contributes positively to coordination between procurement, warehouse, and logistics departments. A substantial proportion of respondents agreed that ERP/SAP supports faster operational decision-making and improves supplier coordination and replenishment planning. ERP/SAP also appears to contribute positively to warehouse operations, order fulfilment, dispatch support, and customer order tracking.

One of the most important findings of the study is that the major perceived benefit of ERP/SAP is improved coordination between departments. The analysis reveals that the most significant challenge in ERP/SAP implementation and usage is training and skill gap (31.1%), followed by resistance to change (27.0%). The overall impact data provide the strongest summary finding of the study: 51.7% of respondents reported high or very high positive impact of ERP/SAP on supply chain coordination, while 27.0% reported moderate impact. These findings indicate that ERP/SAP-enabled systems are generally perceived as beneficial for modern retail and e-commerce supply chains, although the extent of benefit depends on implementation depth, user readiness, and process discipline.

8. Major Findings

1. ERP/SAP adoption is already significant in retail and e-commerce organizations, though many firms still operate with partial implementation.
2. Warehouse management and order processing & fulfilment are the most commonly used ERP/SAP functional areas.
3. ERP/SAP is generally perceived as improving coordination between procurement, warehouse, and logistics departments.
4. ERP/SAP has a positive role in operational decision-making, supplier coordination, dispatch support, and customer order tracking.
5. The most important perceived benefit of ERP/SAP is improved coordination between departments.
6. The most significant implementation challenge is training and skill gap, followed by resistance to change.
7. A majority of respondents perceive ERP/SAP as having high or very high positive impact on supply chain coordination.
8. ERP/SAP effectiveness is influenced by implementation depth, user discipline, process alignment, and organizational readiness.

9. Managerial Implications

Organizations should move beyond partial ERP/SAP implementation and integrate procurement, inventory, warehouse, dispatch, logistics, and order management more comprehensively. Since training and skill gap emerged as the most important challenge, organizations should invest in structured ERP/SAP training, user onboarding, refresher programmes, and practical process-based system education.

Resistance to change should be addressed through better communication, leadership support, process clarity, and user involvement during ERP/SAP rollout and improvement initiatives. ERP/SAP should be embedded in daily planning, review, and escalation routines so that procurement, warehouse, logistics, and service teams work from shared data rather than fragmented manual communication.

ERP/SAP should also be used systematically for purchase planning, vendor follow-up, low-stock monitoring, replenishment scheduling, and procurement visibility. Warehouse transactions such as goods receipt, put-away, transfer, picking, packing, returns, and dispatch should be recorded accurately and consistently in ERP/SAP to improve stock visibility and order-fulfilment reliability.

10. Conclusion

The study concludes that ERP/SAP-enabled systems play a significant and generally positive role in improving supply chain coordination in the retail and e-commerce sector. ERP/SAP is increasingly used across warehouse, order processing, procurement, and logistics functions and is perceived as an important operational support system for coordination, decision-making, supplier planning, dispatch support, and customer order tracking.

At the same time, the benefits of ERP/SAP are not automatic. Their effectiveness depends on implementation maturity, training quality, user discipline, process integration, and organizational readiness. Training and skill gap, resistance to change, and incomplete implementation remain important barriers to full value realization. Overall, ERP/SAP should be viewed not merely as a software application but as a strategic operational system

that can significantly strengthen retail and e-commerce supply chain coordination when implemented and used effectively.

11. Limitations of the Study

1. The study is based on 122 respondents and therefore may not represent the entire retail and e-commerce industry.
2. The study uses convenience sampling, which limits statistical generalizability.
3. The findings are based largely on respondent perception and may involve subjective bias.
4. The study is cross-sectional and reflects responses from a specific period rather than long-term ERP/SAP performance.
5. The study does not examine the detailed internal ERP configuration of any single company and instead focuses on broader sector-level understanding.

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