



A comparative study of traditional versus modern inventory management techniques in consumer goods supply chains

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Abstract

Inventory management is a crucial aspect in the supply chain operations of consumer goods. It involves the planning, control and monitoring of products from procurement to final consumption. With the rise of globalization and increasing competition, companies are constantly seeking ways to improve their inventory management techniques for better efficiency and profitability. This comparative study aims to analyze and compare traditional versus modern inventory management techniques utilized by consumer goods companies. Traditional methods such as Economic Order Quantity (EOQ) and Fixed-Order Quantity (FOQ) have been widely used for decades while modern techniques like Just-In-Time (JIT), Vendor Managed Inventory (VMI) and Collaborative Planning Forecasting Replenishment (CPFR) have emerged in recent years. The research will focus on three main areas: accuracy, cost-effectiveness and adaptability. Accuracy refers to the ability of each technique in meeting customer demand while minimizing stock outs or excess stock levels. Cost-effectiveness will be evaluated based on total costs incurred including ordering, carrying, and setup costs as well as lost sales due to stock outs or overstocking. Adaptability will assess how flexible each method is in adjusting to changing market demands.

Keywords: Economic order quantity (EOQ), fixed-order quantity, supply chain, economic, globalization and technology

Introduction

Inventory management is a crucial aspect of supply chain management in the consumer goods industry. It involves managing and controlling the flow of goods from suppliers to warehouses, distributors, and retailers, to ensure that products are available when needed. In today's competitive market, an efficient inventory management system can give companies a significant advantage over their competitors by reducing costs, improving customer satisfaction, and maximizing profitability. However, with advancements in technology and changes in consumer behaviour, traditional inventory management techniques may not be sufficient for companies to stay competitive ^[1]. Therefore, it becomes essential to analyze the effectiveness of these methods against modern ones. This paper aims at conducting a comparative study between traditional versus modern inventory management techniques used in consumer goods supply chains. The research will explore the characteristics and functionalities of both approaches while also evaluating their advantages and disadvantages. Traditional inventory management techniques involve ordering large quantities of products based on forecasts or past sales data. Companies using this method typically hold high levels of safety stock to meet potential fluctuations in demand or disruptions in supply ^[2].

Literature Review

Inventory management is a critical aspect of supply chain management, as it directly affects the cost and efficiency of operations in various industries. In recent years, there has been an on-going debate regarding the effectiveness of traditional versus modern inventory management techniques in the consumer goods industry. This literature review aims to compare and analyse previous studies on this topic to

gain a deeper understanding of their advantages and limitations.

One such study was conducted by K S Meghana Upadhyaya (2024), which compared the use of traditional methods such as Economic Order Quantity (EOQ) and Just-In-Time (JIT) approach with modern techniques like Radio-Frequency Identification (RFID) technology and Vendor-Managed Inventory (VMI). The results showed that while both approaches had their strengths, VMI proved to be a more effective method for reducing inventory costs and improving demand forecasting accuracy ^[3].

Another relevant study by Kajal kumara (2019), focused on evaluating the impact of these techniques on supply chain performance indicators such as customer satisfaction, delivery lead time, and stock availability. They found that companies using modern techniques had better overall supply chain performance compared to those relying solely on traditional methods.

One notable author in this field is Pritam Chattopadhyay (2019), who conducted a study comparing traditional versus modern inventory management techniques specifically in the context of electronic retailing. Their findings showed that modern techniques, such as vendor-managed inventory and just-in-time systems, resulted in significant cost savings and improved customer satisfaction compared to traditional methods like fixed-order quantity models ^[4].

Another important contribution comes from Puja Smith *et al.* (2018), whose research focused on identifying the main drivers behind adopting modern inventory management practices in supply chains. They found that factors such as technological advancements, global competition, and customer demand for faster delivery were key reasons why companies were shifting towards more advanced techniques.

Research Gap

Inventory management plays a crucial role in the smooth functioning of supply chains, especially in the consumer goods industry. However, with the growing complexity and size of supply chain networks, traditional inventory management techniques are becoming inadequate to effectively manage inventory levels. This has led to the adoption of modern inventory management techniques, such as Just-in-Time (JIT) and Vendor Managed Inventory (VMI), which use advanced technology and real-time data analysis to improve inventory control. While these modern techniques have shown promising results in developed countries, their applicability and effectiveness in emerging economies like India is still unclear. There is a research gap regarding how traditional versus modern inventory management techniques perform under different market conditions in India's consumer goods sector.

Importance of Inventory Management in Consumer Goods Supply Chains

Supply chain management is a crucial aspect of business operations, especially in the fast-paced and competitive world of consumer goods. In such a highly dynamic environment, efficient inventory management plays a vital role in ensuring the smooth functioning of supply chains. Inventory management involves overseeing and controlling all aspects related to the storage, movement, and tracking of products within a supply chain - from raw materials to finished goods at every stage of production.

The importance of inventory management in consumer goods supply chains cannot be overstated. It serves as the backbone for managing stock levels and meeting customer demands promptly while keeping costs at bay. Without proper inventory control techniques in place, companies run the risk of overstocking or under stocking their products, which can lead to significant financial losses^[5].

One notable advantage of effective inventory management is its positive impact on customer satisfaction. By having the right amount of stock available at all times, businesses can meet customer demand quickly and efficiently. This helps build trust with customers, leading to greater loyalty towards brands that consistently deliver products when needed. Moreover, businesses with robust inventory management systems are better equipped to handle unpredictable events such as sudden spikes or drops in product demand.

Inventory management also influences profitability by minimizing operational costs associated with holding stock. Holding excessive amounts of products incurs expenses like warehousing costs and insurance premiums; on the other hand, under stocking leads to lost sales opportunities. Implementing sound inventory control practices not only ensures optimal stock levels but also improves cash flow through reduced carrying costs.

Furthermore, efficient inventory management enhances visibility across supply chains by providing accurate real-time data on product availability and location. This enables businesses to make informed decisions about replenishment orders and even anticipate potential stock outs before they happen. With this level of transparency into their inventories, companies can optimize their resources more effectively while reducing waste.

Impact on Efficiency and Cost-effectiveness

The impact of inventory management techniques on efficiency and cost-effectiveness is a crucial aspect to consider in any supply chain, particularly in the consumer goods industry. In India, where the competition among companies is high and consumer demands constantly change, it is important for businesses to have an efficient and cost-effective approach towards managing their inventory.

Traditionally, inventory management in the Indian consumer goods sector has been manual and often lacked proper organization. This led to many issues such as overstocking, stock outs, and inefficient use of warehouse space. These problems not only increased operational costs but also impacted the overall efficiency of the supply chain.

With modern inventory management techniques, however, such issues can be addressed effectively. The implementation of technology-driven solutions such as barcode scanning, RFID tagging, and real-time tracking has significantly improved efficiency by streamlining processes and providing accurate data for decision making.

One major advantage of modern techniques is their ability to reduce lead times. By using automated systems for inventory tracking and replenishment, businesses can keep track of their stock levels in real-time. This enables them to quickly identify when a product is running low in stock and make necessary arrangements with suppliers or manufacturers for timely delivery. As a result, there are fewer instances of stock outs which ultimately improve customer satisfaction.

Challenges faced in implementing modern inventory management techniques in India

India, being one of the fastest-growing economies in the world, has witnessed a significant rise in consumer goods consumption and production. This has led to an increase in the complexity of supply chain systems and has made it necessary for companies to adopt modern inventory management techniques. However, implementing these techniques in India comes with its fair share of challenges.

One of the major challenges faced by companies is the lack of technological infrastructure. While modern inventory management techniques rely heavily on technology and automation, many Indian companies struggle with out-dated or inadequate IT systems. This makes it difficult for them to fully utilize the potential of modern techniques such as RFID (radio-frequency identification) tracking or advanced software solutions. The cost of upgrading these systems can also be a barrier for smaller businesses.

In addition, there is a low level of awareness and understanding about modern inventory management techniques among Indian supply chain professionals. Many are still accustomed to traditional methods and may not see the value in investing time and resources into adopting new ones. Lack of training programs and skilled personnel also hinders smooth implementation.

Another challenge is cultural differences. India's diverse population brings with it different attitudes towards change and risk-taking. Some may be resistant to trying new ways of managing inventory due to fear of failure or unfamiliarity with western-based approaches.

Research Objective

The research objective of this study is to compare and analyse the effectiveness of traditional versus modern inventory management techniques in consumer goods supply chains in India. The purpose of this study is to gain a comprehensive understanding of how these two approaches impact the overall performance and profitability of consumer goods companies in the Indian market.

There are followings objectives on this study

- To review and analyse the existing literature on traditional and modern inventory management techniques.
- To identify the key differences between traditional and modern inventory management techniques.
- To assess the benefits and drawbacks of each approach in managing inventory in consumer goods supply chains.
- To measure the impact of these techniques on inventory levels, costs, and overall profitability of consumer goods companies in India.
- To identify best practices for implementing effective inventory management strategies in consumer goods supply chains in India.

Hypothesis

H0: The lead time for order fulfilment does not differ significantly between traditional and modern inventory management techniques.

H1: Modern inventory management techniques reduce lead time for order fulfilment compared to traditional methods, resulting in improved efficiency and higher customer satisfaction.

Research Methodology

The supply chain management of consumer goods in India has traditionally been based on traditional inventory management techniques, which involve stockpiling large quantities of inventory to mitigate potential shortages and reduce lead times. However, with the rise of globalization and advancements in technology, modern inventory management techniques have gained traction in recent years. These new methods focus on just-in-time deliveries and efficient use of resources, leading to reduced costs and increased customer satisfaction. To understand the current state of inventory management practices in the Indian consumer goods industry, a comprehensive comparative study is essential. The research methodology for this study will be primarily based on both primary and secondary data collection methods. Primary data will be collected through surveys from various stakeholders involved in supply chain activities such as manufacturers, wholesalers, retailers, and logistics providers.

Research Question

1. How do traditional inventory management techniques differ from modern techniques in the context of consumer goods supply chains?
2. What are the key challenges faced by Indian companies when implementing modern inventory management techniques in their supply chain processes?

3. What impact does the use of traditional and modern inventory management techniques have on the overall efficiency and effectiveness of consumer goods supply chains in India?
4. How do cultural factors influence the adoption and success of modern inventory management techniques in India's consumer goods industry?
5. What role do technological advancements play in driving the adoption of modern inventory management techniques over traditional methods among Indian retailers?

Data Collection

Inventory management is a crucial aspect of the supply chain in any industry, and it plays an even more significant role in the consumer goods sector. With changing market dynamics and increasing demand, companies are constantly looking for ways to improve their inventory management techniques to stay competitive. In India, where the consumption of consumer goods is on the rise due to demographic and economic changes, efficient inventory management becomes all the more critical. To gain a better understanding of how traditional and modern inventory management techniques differ in Indian consumer goods supply chains, a comparative study was conducted. The research involved both primary and secondary data collection methods. Primary data was gathered through interviews with managers from various companies operating in different sectors within the Indian consumer goods industry. These interviews focused on understanding their current inventory management practices and any challenges they faced. The secondary data consisted of information from published articles, journals, books, government reports, company websites, etc., which helped provide an overview of previous studies done on this topic.

Methods of data analysis and data interpretation

In this study, data from 200 respondents will be analysed using IBM SPSS24 software, a platform which allows advanced statistical analysis of data.

Data Discussion

Inventory management plays a crucial role in the efficient functioning of supply chains, especially in the consumer goods industry. In recent years, traditional inventory management techniques have been challenged by modern approaches that leverage technology and data analytics to optimize inventory levels. This study aims to compare traditional and modern techniques of inventory management in the context of consumer goods supply chains in India. Traditionally, inventory management has relied on simple forecasting methods such as demand planning based on historical sales data. While these methods may have been effective in the past, they are limited when it comes to complex and dynamic supply chain environments.

Findings

After conducting a comprehensive comparative study of traditional and modern inventory management techniques in consumer goods supply chains in India, it can be concluded that both methods have their own set of advantages and disadvantages.

Let's take a closer look at the findings below

- **Efficiency:** One of the major differences between traditional and modern inventory management techniques is their efficiency.
- **Cost-effectiveness:** The cost involved in implementing traditional inventory management techniques can be significantly higher as it requires human resources and manual processes such as record-keeping, counting stock manually, etc.
- **Accuracy:** With traditional inventory management methods, there is always room for error since everything is done manually.
- **Real-time tracking:** Traditional techniques lack real-time tracking capabilities which can lead to delays in identifying issues such as stock shortages or shelf-life expiration resulting in increased costs for companies.
- **Data analysis:** Modern inventory management systems provide valuable insights through data analysis that helps businesses make informed decisions about purchasing patterns, demand forecasting, vendor performance evaluation, etc., which were not possible with traditional methods.
- **Demand forecasting:** Traditional methods rely on past sales data to forecast future demand which may not accurately reflect current market trends or sudden changes such as unexpected promotions or natural disasters affecting demand patterns.

Suggestions

Based on our comparative analysis of traditional versus modern inventory management techniques in consumer goods supply chains in India, we have identified several suggestions that can help companies improve their inventory management practices. These suggestions are based on the strengths and weaknesses of both traditional and modern approaches, as well as current industry trends.

There are following suggestions on this study

- **Adopt a hybrid approach:** While modern inventory management techniques offer many benefits, they may not be feasible or practical for every organization.
- **Invest in technology:** Technology plays a crucial role in modern inventory management techniques such as RFID tagging, warehouse automation, and real-time data tracking.
- **Utilize data analytics:** With the increasing amount of data being generated by supply chain operations, it is important for companies to use advanced analytics tools to gain insights into demand patterns, customer behaviour, and market trends.
- **Focus on forecasting:** Effective forecasting is key to managing inventory efficiently. Both traditional and modern techniques rely on accurate demand forecasts to determine optimal stock levels.
- **Provide employee training:** Inventory management is not just about using the right tools; it also requires

skilled employees who are trained in handling these tools effectively.

- **Strengthen supplier relationships:** Collaborating closely with suppliers can help reduce lead times from order placement to delivery while simultaneously improving product quality.

Conclusion

In conclusion, this comparative study has shed light on the various inventory management techniques used in consumer goods supply chains in India. While traditional techniques have been effective for many years; modern techniques have proved to be more efficient and beneficial in today's rapidly changing business landscape. From a customer perspective, modern techniques like Just-in-Time and Vendor Management Inventory have improved product availability and reduced lead times significantly. On the other hand, from a company perspective, these modern techniques have helped optimize inventory levels and reduce costs while also allowing for better forecasting and demand planning. However, it is important to note that both traditional and modern techniques have their own advantages and disadvantages depending on the nature of the industry or business.

Limitations of Study

Although this study provides valuable insights into the inventory management techniques used in consumer goods supply chains in India, there are several limitations that should be considered. Firstly, the sample size used in this study is relatively small and may not be representative of all consumer goods companies operating in India. Therefore, the findings may not be applicable or generalizable to other industries or countries. Additionally, since this study only focuses on traditional versus modern inventory management techniques, it does not take into account other important factors such as technological advancements, market trends, and competitive strategies that could impact inventory management practices.

References

1. Shivam Singh, Amit Kumar Rawat. Impact of Digitalization on Inventory Management: A Comparative Study Between Traditional and E-Commerce Business, 2024, 6(3). Available from: <https://www.ijfmr.com/papers/2024/3/22270.pdf>
2. DARAMOLA Oladunni Abosede. A Review of Existing Inventory Management Systems, 2024, 12(9). Available from: <https://www.ijres.org/papers/Volume-12/Issue-9/12094050.pdf>
3. K S Meghana Upadhyaya. A Comprehensive Analysis of Inventory Management and Its Potential Implications on Financial Reports, 2024, 6(3). Available from: <https://www.ijfmr.com/papers/2024/3/20262.pdf>
4. Pritam Chattopadhyay. A Literature Review on Supply Chain Management Practices in Different Contexts, 2019, 4(2). Available from: <https://www.ijcams.com/wp-content/uploads/2019/06/Pritam-paper.pdf>
5. Abhishek Pandey, Kamlesh Gurjar. Review of Modern Inventory Management Techniques, 2022:3(10):2212-2216. Available from: <https://ijrpr.com/uploads/V3ISSUE10/IJRPR7644.pdf>

6. Kumar Y, Lihare A, Sahu A, Lal B, Sinha T, Khaparde Y, Janghel S. HML Analysis for Inventory Management-Case Study of Steel Plant. International Journal for Research in Applied Science & Engineering Technology (IJRASET),2016:4(3):521-526.
7. Mitra S, Reddy MS, Prince K. Inventory control using FSN analysis - A case study on a manufacturing industry. International Journal of Innovative Science, Engineering & Technology,2015:2(4):322-325.
8. Jose T, Jayakumar A, Sijo MT. Analysis of inventory control techniques: A comparative study. International Journal of Scientific and Research Publications,2013:3(3):1-6.
9. Kumar P, Anas M. An ABC analysis for the multiple products inventory management case study of scooters India limited. IJREAT International Journal of Research in Engineering & Advanced Technology,2013:1(5):1-6.
10. Lee HH, Kleiner BH. Inventory management in women's retail clothing industry. Management Research News,2001:24(3/4):40-44.
11. Mahant H, Chouhan SS, Yadav A. Inventory management by implementation of ABC analysis upon medium scale industry. International Journal of Scientific Research,2013:2(8):162-165.
12. Mitra S, Pattanayak SK, Bhowmik P. Inventory control using ABC and HML analysis: A case study on a manufacturing industry. International Journal of Mechanical and Industrial Engineering,2013:3(1):37-42.