

# Inventory Control- Supply Chain Solution: Case Study

**Dr. S. Vasantha, Dr.M.Thaiyalnayaki, A.Yalini**

Corresponding Author Professor, School of Management Studies,  
vasantha.sms@velsuniv.ac.in

Professor , Department of Commerce ,

m.thaiyalnayaki.sms@velsuniv.ac.in

Student , MBA LSM

yalu036@gmail.com

Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai,

**Abstract-** Supply chain management is a fundamental cornerstone of business operations, and effective inventory control plays a pivotal role in ensuring its success. This article presents a comparative analysis that sheds light on the critical role inventory management plays in enhancing supply chain efficiency. By analyzing the inventory control practices of TVS Supply Chain Solutions alongside industry giants like Amazon, Walmart, and FLIPKART, it becomes evident that precise demand forecasting, real-time inventory visibility essential in addressing the evolving needs of customers. These case studies collectively emphasize how investment in inventory control analysis and supply chain optimization can empower organizations to swiftly respond to changing market dynamics, trim operational costs, and, most notably, bolster profitability and customer satisfaction.

**Keywords-** Case Study, Inventory Control, Supply Chain Management

## I. INTRODUCTION

**Inventory control becomes a significant factor in any modern organization to accomplish a balance** between competing goals.

### **Inventory Control Methods:**

A number of inventory control methods are accessible, including Just-In-Time (JIT), the ABC analysis, and the Economic Order Quantity (EOQ). Given a number of assumptions regarding the product's demand, order cost, and holding cost, the EOQ method calculates the ideal amount of inventory to order. Relying on frequent, small deliveries from suppliers, on the other hand, aims to reduce inventory levels. Demand Forecasting: For effective inventory control, accurate demand forecasting is essential. Various studies have contrasted the accuracy of various forecasting methods, including the moving average, exponential smoothing, and neural networks, in predicting demand.

**Warehouse Design:** The design of the warehouse can significantly affect inventory management. The effects of various warehouse layouts, including the single-aisle and double-aisle layouts, on inventory levels, throughput, and effectiveness have been investigated by researchers. **Environmental Considerations:** The effects of inventory management on the environment should also be taken into account. Utilizing reusable containers, environmentally friendly packaging, and sustainable transportation have all been investigated with regard to how inventory management affects the environment.

### **Inventory costs:**

The expenses related to operating an inventory system are crucial in defining what the operational doctrine should be. When selecting how much to reorder and when to do so, managers should only take into account costs that directly correlate with the operational ideology inventory system. The following are the many expenses that could play a big role in deciding what the operational doctrine is. **Ordering cost:** It is the cost of refilling the inventory supply on hand, and it is irrespective of order size. Yearly ordering expenses fluctuate with the number of orders placed; as the number of orders grows, so does the ordering cost. **Ordering fees** include the expenses of creating a requisition, a buy order, and a receiving ticket, stocking the commodities when they arrive, processing the supplier's invoice, and remitting payment to the supplier.

**Holding cost:** It is the variable cost of holding products in stock, which includes interest, storage and handling, taxes, insurance, pilferage, and shrinkage. The holding cost changes as these components vary within inventory levels. Businesses often indicate an item's holding cost as a percentage of its worth over time.

**Shortage cost:** When demand exceeds the available inventory, a shortage arises. If there is a lack of semi-finished items, raw materials, and so on, final output manufacturing will suffer. In the case of finished items, a lack of supply equals a loss of targeted consumers. They may seek satisfaction from other competitive companies. Sometimes voluntary shortages are part of a company's aim

to increase demand. The shortfall cost is indicated per unit of the lost sale in all of these situations.

**Purchase cost:** This covers the cost of processing the purchase order, which includes wages, rents, stationery, phone charges, receiving and inspection fees, costs to pay suppliers' bills, and other incidental purchasing costs.

**Transportation cost:** Transport expenses are the monetary amount that a transportation provider must spend in order to offer transportation services. The expense of transporting the product is significant.

#### Inventory control techniques:

**Businesses utilize a variety of inventory control approaches to properly manage their inventory. Among the most prevalent approaches are:**

**ABC analysis:** This approach divides inventory into three groups depending on its worth and significance. High-value products make for a major share of sales, while medium-value items and low-value items account for the remainder.

**JIT inventory:** This strategy includes ordering and receiving merchandise just in time to meet demand, reducing the quantity of inventory maintained in stock.

**Economic Order Quantity (EOQ):** This approach determines the best order quantity based on the cost of ordering and retaining inventory.

**Safety stock:** Keeping a specific amount of additional inventory on hand to defend against unexpected demand or supply chain interruptions.

**Drop shipping:** This process requires having suppliers send items straight to buyers, eliminating the need to have inventory on hand.

**Consignment inventory:** This approach involved keeping inventory on behalf of a supplier and receiving payment only when the inventory is sold.

Businesses may optimize their inventory levels, save expenses, and enhance customer satisfaction by utilizing these inventory control approaches.

#### Objective

To analyze the inventory control and supply chain solutions referring to companies as part of a case study method.

## II.LITERATURE REVIEW

**Singh et. al (2022):** The essence of inventory control is the availability of excellent quality stock, in the appropriate quantities, at the right location and time, and at the right cost, which is essential for the warehouse operation and provision of services. Based on cost, criticality, and other considerations, there are several methodologies available for inventory control, including ABC analysis, VED analysis, ABC VED matrix, FSN analysis, SDE analysis, etc. Each technique's applicability has its own advantages and disadvantages. Economic factors are also crucial for the logistical management. Therefore, any cost savings may be invested more profitably in other areas, perhaps saving more

lives, lowering morbidity rates, and having a more beneficial overall effect.

**Ruud H et. al (2022):** It is found the best inventory management for two items with demand substitution, where customers choose the other product if the first one isn't available. Reviewing the fundamentals, we provide a simulated Economic Order Quantity type model with two replacement items that have the same constant demand rate and cost structure. We don't assume that both goods must be ordered at the same time, contrary to the literature. Most intriguingly, it appears that there is an asymmetric solution to this symmetric problem. If replacement level is the safest alternative, one-way substitution is always used and never two-way substitution.

**M D P Asana et. al (2020):** The goal of determining the reorder point is to maintain the safety supply. This is a key element of inventory management. This study seeks to identify a reorder point based on safe stock and product categorization. Currently operational retail information systems use this strategy. The number of active goods in the information system is about 15,000, and there are roughly 1,100 daily sales transactions. The absence of the safe stock reference makes figuring out the reorder point difficult. The ordering of products mistake was brought on by a lack of safe stock information. Overstock results from this mistake. It could make it more likely that products will expire. The quantity of safe stock needed to maintain inventory management is determined by classifying the products and categorizing them.

**Zhenyang Shi & Shaoxuan Liu (2020):** It is examined how a manufacturer dealing with component obsolescence, when the supply of a particular part terminates early in a product's life cycle, makes decisions about part inventory control and product design renewal planning together. The component is required for both product assembly and the resolution of warranty claims, and the demand for replacement parts during warranty servicing is based on prior sales. The problem of obsolescence has two suggested solutions: design update and inventory control. In design refresh, alternative parts in plentiful supply are employed to replace outmoded ones, and inventory control assures enough supplies using strategies like last-time buy (the final order delivered by the supplier). We provide an ideal stopping model with extra choices to determine when a design refresh is necessary.

**Jan Riezebos & Stuart X. Zhu(2019):** Over antiquity, cyclical patterns may be visible in the duration of the seasons and the lead times within a season. This study investigates if cost-saving inventory control strategies may be achieved by foreseeing seasonal lead-time trends. We create a framework to classify various seasonal lead-time inventory issues. The impact of deterministic and stochastic seasonal lead times within periodic review inventory control systems is then investigated.

The article's findings point to the possibility of cost reductions. Inventory controllers may place better-informed orders for raw materials by taking seasonality the duration of seasons and the length of lead times within each season into account in the control models. Due to seasonality cyclical nature, they require lower buffers against lead-time changes. In our tests, cost reductions vary, on average, between 18.9 and 26.4% (depending on safety time and the probability of the occurrence of stock out). As a result, using inventory control strategies that consider seasonality rather than seasonality into 28 account rather than using big safety stock or safety time buffers might result in significant cost savings.

**D Abu Gharbieh et.al (2019):** An inventory control system may assist businesses in managing their stock, inventory, and establishing tabs on the exact location and value of their assets. Additionally, the system evaluates the company's inventory level, may even automate ordering, and aids in improving firm operations and contributed to the growth through improved customer service and lower inventory expenses. The company has faced multiple issues with the current warehouse management system, as well as product classification, inventory management, order scheduling, scheduling, and other issues, storage of liquid products, process control tools, inventory planning, orders dispatching, and other issues. In order to improve the efficacy and efficiency of the current inventory management systems, inventory control analysis was used.

**Leonardo Ramos Rodrigues et.al (2020)** Any inventory control model's effectiveness depends on how well future demand is predicted. The safety inventory level required to satisfy demand and meet fill rate criteria decreases in direct proportion to how accurately future demand estimations are made. Time series profiles are frequently utilized to forecast future needs in most real-world situations. Utilizing data obtained from tracking the component deterioration level can help increase the precision of demand prediction in the specific situation of spare parts inventory. When demand behaviour might alter over time, such as when operating conditions change, this strategy may be extremely crucial.

**Rashmi Ranjan Panigrahi &DuryodhanJena (2019)** A big aspect of any company concern is inventory control. Controlling your materials and inventory is one of the first stages in establishing your firm and assessing its present status. Through the material management function, inventory control is essential to raising productivity. A conceptualization and understanding of the importance of the inventory control system in connection to the material management function has been attempted in the present studies. It demonstrates that improved material management is a result of good inventory control procedures. 29

**Esra Agca Aktunc et.al (2019)** This research looks at the inventory and production management of a number of items

from a major personal and industrial gas metre manufacturer. For inventory goods, ABC and XYZ analyses are used to calculate the Economic Order Quantity and the production strategy for each item class. Following this analysis, the firm chooses one of its finished products to create the Materials Requirement Plan (MRP) for. According to the inventory levels, the MRP is built and the Bill of Materials for the selected product is prepared. MRP is used to determine the necessary quantities for all sub materials that make up the finished product. In order to access, update, and add the required information easily.

**Krishnaveni S (2019):** One of the most talked-about subjects in production and material management is inventory analysis. The fact that practically all commercial organizations have inventory is one of the factors. Inventory is frequently a company's most valuable current asset. A manufacturing process's partially finished goods, primary components, resources, final product, manpower, or currency are also included in inventory. Inventory is kept to satisfy consumer demand, prevent stock-outs of materials that may halt production or even serve as a safety net in the event of strikes and lockouts, and manage vendor supply-chain uncertainty. Effective inventory management may significantly increase a company's profit.

**Ata Jalili Marand et. al (2019)** The combination control of inventory and pricing for a service-inventory system are the topics of this study. To meet consumer requests in such a system, both an item from the on-hand inventory and a desirable service time are necessary. The service-inventory system also incorporates key elements of traditional inventory systems with fast processing times, such as systems that are made to order. The inventory's lead periods for replenishment are dispersed exponentially. Moreover, clients that arrive during times of stock-out are lost. The unpredictable customer inter-arrival times, service delays, and lead periods for inventory replenishment are to blame for the problem's high complexity and challenging nature. The formulation and ideal approach to the issue are the purposes of this study.

### III. RESEARCH METHODOLOGY

The case study involving Tvs Supply Chain Solutions, Walmart Supply Chain Solutions, and Flipkart Supply Chain Solutions, will involve a structured approach. It will begin with defining research objectives and questions, followed by an extensive literature review to establish a theoretical framework. The study will focus on case selection, involving specific units within each company, and data collection, encompassing both primary (interviews, surveys, site visits) and secondary data sources. Data analysis will employ appropriate techniques to compare and contrast inventory control practices. A cross-case analysis will identify patterns and differences, with a theoretical framework applied to explain findings. The study will culminate in findings,

discussion, and recommendations while acknowledging limitations and suggesting avenues for future research.

### Comparision Of All Cases

To provide a comparative analysis of inventory control practices between TVS Supply Chain Solutions, Flipkart Supply Chain Solutions, Amazon Supply Chain Solutions, and Walmart Supply Chain Solutions, let's examine their approaches and key features:

TVS Supply Chain Solutions is a global logistics provider that offers end-to-end supply chain management solutions. While TVS Supply Chain Solutions has expertise in various industries, it primarily serves automotive, retail, healthcare, and aerospace sectors. The company focuses on leveraging technology, accurate forecasting, and real-time visibility to optimize inventory levels and reduce holding costs. TVS Supply Chain Solutions utilizes predictive analytics, RFID, and Warehouse Management Systems (WMS) to achieve inventory optimization and improve customer satisfaction.

- Flipkart is a leading e-commerce company in India and has its supply chain arm called Flipkart Supply Chain Solutions. The company emphasizes efficient inventory control to ensure fast and reliable product delivery. Flipkart utilizes advanced technology and analytics to optimize inventory levels and reduce holding costs. Their inventory control practices include real-time tracking, demand forecasting algorithms, and automated replenishment systems. Flipkart also focuses on strong partnerships with suppliers to maintain optimal inventory levels and minimize stockouts.
- Amazon, a global e-commerce giant, is known for its highly efficient supply chain and inventory management practices. Amazon's supply chain solutions prioritize customer satisfaction and fast delivery. The company leverages advanced technologies, such as sophisticated algorithms and machine learning, to forecast demand accurately and optimize inventory levels. Amazon emphasizes real-time visibility and data-driven decision-making to minimize holding costs while ensuring product availability through its extensive warehousing and distribution network.
- Walmart, one of the world's largest retailers, operates a vast supply chain network to meet customer demands efficiently. Walmart focuses on inventory control to minimize stockouts and reduce holding costs. The company employs advanced technology, such as point-of-sale data analytics, to optimize inventory levels and accurately forecast demand. Walmart also emphasizes vendor collaboration and efficient replenishment processes to maintain optimal inventory levels and streamline the supply chain.
- In terms of comparative analysis, all four companies emphasize the importance of technology, accurate forecasting, and real-time visibility in their inventory control practices. They strive to optimize inventory levels, reduce holding costs, and enhance customer satisfaction. However, there are some differences based on their industry focus and business models.

- TVS Supply Chain Solutions focuses on providing end-to-end supply chain solutions across multiple industries. Flipkart Supply Chain Solutions primarily operates in the e-commerce sector, while Amazon is a global e-commerce giant with a strong focus on customer-centric operations. Walmart is a leading retailer with an extensive physical store network.

### FINDINGS

#### Inventory Control Analysis In Flipkart Supply Chain Solutions:

To manage its inventory levels effectively during the pandemic, Walmart used advanced inventory control analysis tools. These tools included demand forecasting and inventory optimization techniques. Through demand forecasting, Walmart was able to predict which products would experience a surge in demand due to the pandemic, such as cleaning supplies and toilet paper. This helped the company to adjust its inventory levels to meet customer demand and avoid stock outs. Inventory optimization tools helped Walmart to manage its inventory levels and reduce costs. For example, the company used techniques such as cross-docking and vendor-managed inventory to streamline its supply chain operations and reduce the amount of inventory it needed to hold.

#### Inventory Control Analysis In Amazon Supply Chain Solutions:

One of the key findings from the case is that Amazon's inventory control analysis is a critical component of its supply chain management strategy. By using advanced forecasting techniques, the company can predict future demand and adjust its inventory levels accordingly. This helps Amazon to avoid stock outs and overstocking, which can be costly for the company. Additionally, by optimizing its inventory levels, Amazon can reduce its warehousing and transportation costs, which helps to improve its profitability.

#### Inventory Control Analysis In Walmart Supply Chain Solutions:

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#### Inventory Control Analysis In Tvs Supply Chain Solutions:



After analyzing the inventory control system, TVS Supply Chain Solutions found that the company had inadequate forecasting methods, leading to inaccurate demand predictions. This resulted in overstocking or under stocking of products, which affected customer satisfaction and increased holding costs. Additionally, the company had poor visibility into its inventory levels, which made it

#### 1. Flipkart Supply Chain Solutions:

- Implement a standardized approach to managing inventory across all warehouses.
- Establish inventory level thresholds and ordering patterns based on historical data and customer demand.
- Invest in automation technology to reduce manual intervention and improve accuracy.
- Incorporate real-time inventory tracking technology to enable optimal inventory management and avoid stock outs.

#### 2. Amazon Supply Chain Solutions:

- Explore the use of artificial intelligence and machine learning algorithms to improve inventory control analysis.
- Identify patterns and trends in customer behaviour to make real-time adjustments to inventory levels.
- Improve responsiveness to changes in customer demand.

#### 3. Walmart Supply Chain Solutions:

- Invest in advanced forecasting and data analytics tools to improve demand forecasting accuracy.
- Leverage technology to optimize inventory levels and reduce costs.
- Implement a more flexible and agile supply chain to respond to unexpected events.

#### 4. Tvs Supply Chain Solutions:

Adopt a more accurate demand forecasting method using historical data or predictive analytics.  
Invest in technology that provides real-time visibility into inventory levels.

## IV. CONCLUSION

Effective inventory control is a critical aspect of supply chain management, and the case studies of TVS Supply Chain Solutions, Amazon, Walmart, and FLIPKART demonstrate the importance of accurate demand forecasting, real-time visibility into inventory levels, and leveraging advanced technologies such as artificial intelligence and machine learning. By investing in inventory control analysis and supply chain optimization, companies can improve their responsiveness to changing customer demands, reduce costs, and ultimately increase profitability and customer satisfaction. Therefore, TVS supply chain solutions has implemented an effective inventory management system for the essential businesses looking to maintain their competitive edge and succeed in today's dynamic and fast-paced marketplace.

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