



The Impact of Inventory Management on Procurement Performance in India's Large Manufacturing Sector.

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Abstract- Purpose: In the competitive landscape of the Indian manufacturing sector, procurement efficiency is vital for meeting client demands. However, recent data indicates a concerning 23% increase in procurement performance gaps, leading to widespread stakeholder dissatisfaction. This study investigates the impact of inventory management strategies specifically Economic Order Quantity (EOQ) and Activity-Based Costing (ABC) on the procurement performance of major manufacturing firms in India.

Methodology: The research utilized a descriptive research design targeting procurement authorities within large-scale manufacturing enterprises. Applying the Cooper and Schindler formula, a sample of 187 procurement officers was selected through simple random sampling to ensure unbiased population representation. Data was collected via structured questionnaires and analyzed using descriptive statistics, including frequencies, mean, and standard deviation.

Findings & Recommendations: The study underscores a significant correlation between strategic inventory modeling and operational success. The findings suggest that integrating EOQ calculations and ABC frameworks into standard procurement procedures is essential for optimizing costs and performance. It is recommended that major industrial corporations formally embed these strategies into their procurement workflows to mitigate performance deficits.

Keywords: Inventory management strategies, procurement performance, economic order quantity, activity-based costing, manufacturing enterprises.

I. INTRODUCTION

The Strategic Evolution of Procurement Procurement is a vital business management function dedicated to identifying, sourcing, and managing external resources to secure optimal supplies and services for stakeholders. By actively exploring market opportunities and deploying strategic resource frameworks, organizations can significantly reduce costs and boost overarching earnings (Zai, 2021). Globally, procurement practices have transitioned from a reactive, operational task into a strategic imperative. This evolution is necessary to align with the expanding scope of supply chain activities and to foster robust, efficient systems governed by transparent legal structures (Dimitriadis & Maroudas, 2017; Hunja, 2019). Procurement excellence is now recognized as a cornerstone of operational success, particularly during economic downturns, when companies rely heavily on procurement departments to drive strategic cost-reduction initiatives and maintain viability (Schiele & McCue, 2016).

The Balancing Act of Inventory Management Effective inventory management remains a critical managerial priority across enterprises of all sizes (Ahmed, 2016). The fundamental challenge lies in harmonizing supply availability with consumer demand. Organizations must maintain sufficient stock to prevent lost sales caused by inventory stock-outs (Danese & Kalchschmidt, 2017), while simultaneously avoiding the prohibitive carrying expenses associated with excess stockpiles. The ultimate objective is to maintain an optimal equilibrium—having exactly what is needed, without exceeding operational limits (Coyle, Bardi, & Langley, 2018). When executed efficiently, inventory management accelerates turnover rates and can decrease associated costs by 10% to 40%. However, contemporary supply chains often struggle to optimize this turnover efficiently, particularly regarding the execution of seamless First-In-First-Out (FIFO) retail cycles (Ofori-Ayeh, 2016).

Shifting Paradigms: From Buffer Stocks to Just-In-Time Historically, manufacturers relied on substantial buffer inventories spanning raw



materials, work-in-progress components, and finished goods as a safeguard against supply chain disruptions (Lwiki et al., 2017). Recognizing that excessive buffers tie up vital capital and generate hidden expenses, modern organizations have fundamentally shifted their manufacturing and inventory paradigms. Since the early 1980s, the dominant strategy has focused on inventory reduction through methodologies like Just-In-Time (JIT), where materials are acquired and processed precisely as needed. While these lean strategies have successfully driven down inventory levels and reduced immediate costs for many companies (Agu, Obi-Anike, & Eke, 2016), the empirical evidence linking these reductions to overall enhanced company performance remains inconclusive (Etale & Bingilar, 2016). Consequently, establishing a clear understanding of how these evolving inventory management strategies directly impact procurement performance is a critical area for ongoing research. Here is a refined and restructured version of the problem statement, organized to highlight the core issues, the theoretical context, and the research gap clearly:

II. PROBLEM STATEMENT

The Procurement Challenge in Manufacturing
Procurement is a foundational driver of growth, efficiency, and competitive advantage for industrial enterprises in India (Kamotho, 2018). Despite its critical role, stakeholders in the manufacturing sector have reported growing dissatisfaction with current procurement performance, evidenced by a concerning **23% increase in related complaints** (Miheso, 2013; Malela, 2016; Makau, 2018). These systemic operational failures are primarily characterized by:

- Extended procurement lead times.
- Inadequate service delivery and unreliability.
- Non-compliance with established procurement regulations.
- Exorbitant costs for sourcing products and services.

Scholars contend that these persistent procurement bottlenecks within large manufacturing enterprises can be systematically addressed through the deployment of efficient inventory management systems (Malela, 2016; Kemunto, 2017).

The Critical Role of Inventory Management

Inventory constitutes a major portion of current assets within the manufacturing sector. While substantial capital is tied up in stock to guarantee seamless production and meet client demands, carrying this inventory incurs significant ongoing expenses. Balancing the advantages of holding stock

against the financial drain of storage is essential (Essel, 2020). Failure to manage inventory effectively predictably leads to stock shortages, diminished productivity, eroded profit margins, and customer dissatisfaction (Nyongesa & Shale, 2019). Given the intense competition across industries, rigorous inventory management is no longer optional; it is a mandatory competency required to protect a crucial and scarce organizational resource (Garba, 2018).

Research Gap and Objective While the broader relationship between inventory management and organizational performance has been studied across various sectors—such as in NGOs (Rogito, 2019), regional milk processing facilities (Gathoni & Ngugi, 2016), and the food and beverage industry (Wachaiyu, 2019)—a distinct empirical gap remains. None of these prior studies have specifically investigated the intersection of inventory management techniques and procurement performance within the context of major industrial enterprises in India.

Therefore, the primary objective of this study is to bridge this academic and practical gap by determining the direct impact of inventory management strategies on the procurement performance of major Indian manufacturing companies.

III. EXPLICIT GOALS

Research Objectives

General Objective: To determine the overarching impact of inventory management strategies on the procurement performance of major manufacturing enterprises in India.

Specific Objectives:

1. **Economic Order Quantity (EOQ):** To investigate the impact of integrating Economic Order Quantity models on the procurement performance and operational efficiency of major manufacturing firms in India.
2. **Activity-Based Costing (ABC):** To determine the influence of Activity-Based Costing frameworks on the procurement processes, cost optimization, and overall performance of these industrial enterprises.

IV. REVIEW OF EXISTING LITERATURE

Theoretical Review: Economic Order Quantity (EOQ) Model

The EOQ model, sometimes known as the Wilson EOQ model, was established by Ford Wilson Harris



in 1913. Kumar (2016) conducted a rigorous critical analysis of the concept. The implementation of the model has demonstrated a growth in certain expenses while other expenses decrease. For instance, the costs associated with placing orders decrease as the inventory holdings increase, but the costs of storing goods rise. The overall curve representing the total costs connected with inventory reaches a minimum point. It is sometimes referred to as the point of minimum total inventory costs. The Economic Order Quantity (EOQ) is the optimal inventory level that minimizes the combined expenses of maintaining inventory and placing orders. The economic order-quantity model takes into account the balance between the cost of ordering and the cost of storing when determining the optimal quantity for replenishing item stocks. Increasing the size of an order decreases the frequency of ordering, resulting in a lower monthly ordering cost. However, it also leads to a higher average inventory, which in turn increases the monthly storage cost. Conversely, a smaller order size decreases the average inventory but necessitates more frequent ordering and incurs higher monthly ordering costs (Kazemi et al., 2018). The EOQ model assists firms in minimizing inventory management expenses by decreasing the costs associated with ordering and storing stock. The purpose of this study was to evaluate the impact of Economic Order Quantity on the procurement performance of major industrial enterprises in India.

The theory of goal setting According to Locke (1990) and Latham (2002), the goal setting theory states that it focuses on the individual or organizational motivation to achieve desired outcomes. They assume that the budgeting process is a procedure for determining and assigning actions, which establishes the criteria for comparing real accomplishments. Inductive development of over 25 years in the field of industrial organization psychology, based on 400 laboratory and field studies, has demonstrated that setting specific high goals leads to better task performance compared to setting easy goals or vague goals such as the encouragement to "do one's best" (Chituri et.al, 2016). A budget is a strategic tool used to establish specified objectives for a business within a defined timeframe. The fundamental principle is that setting precise objectives leads to greater performance outcomes compared to individuals who simply aim to "do their best". The performance advantages of pursuing tough and well-defined goals have been extensively proven through several laboratory and field research. These goals have a beneficial impact on the performance of individuals, groups, organizational units, and entire organizations over

extended periods, such as twenty-five years (Heslin, Vande Walle, & Carson, 2019).

Challenging goals can empower individuals to improve their performance by offering guidance and a measurable benchmark for development. The scholarly and practitioner literatures extensively document that having specific goals can enhance motivation and performance. This is because specific goals help individuals concentrate their attention and increase their effort towards a particular objective. Furthermore, specific goals enable individuals to persist in the face of setbacks and develop new strategies to achieve their goals. Challenging goals frequently result in valuable rewards such as recognition, promotions, and increased money in the workplace, as demonstrated by motivational processes (Nawanir et.al, 2018).

A budget include not only the objectives to be accomplished but also the nominal values associated with them. Activity-based budgeting is derived from activity-based costing (ABC), a method that is comparable to zero-based budgeting. This budget category pertains to the manner in which staff workers distribute their time and energy across several activities (Keta, 2022). After determining the total cost of each activity, it is possible to develop drivers that connect support activities to the main operations of the organization. In a law enforcement setting, the primary activities refer to the direct costs associated with program delivery (Abdilahi, Kithinji & Naminda, 2023). By formulating a thorough activity-based budget, executives can establish a direct correlation between the amount of work and the associated expenses. Once developed, executives and managers can exert control through various methods. These include allocating personnel based on demonstrated necessity, adjusting the size of the workforce in proportion to changing needs, identifying and eliminating wasteful practices and hidden expenses, evaluating activities in terms of their cost-effectiveness, thus making them subject to scrutiny, assessing the overall efficiency of the organization, identifying areas where costs can be reduced, establishing a cost baseline that can be influenced by process or technological changes that decrease the effort required for certain activities, and advocating for the organization's budget from an informed and objective standpoint. This study utilized the idea of Activity Based Costing to determine the impact of this cost management approach on the procurement performance of major manufacturing firms located in India

Abstract Model

A conceptual framework is a visual representation of interconnected ideas that explain a certain



phenomena. It consists of cause and effect links that aid in interpretation, making it easily comprehensible. This enhances clarity and facilitates accurate predictions (Svinicki, 2019). The figure illustrates the correlation between dependent and independent variables. The study examines the impact of two independent factors, Economic Order Quantity and Activity Based Costing, on the procurement performance of large manufacturing enterprises in India.

Economic Order Quantity refers to the optimal quantity of goods that should be ordered to minimize costs. It takes into account factors such as demand forecasting, re-order level, and holding cost.

Activity Based Costing (ABC) is a method used to allocate costs to specific activities inside a company. It involves optimizing inventory levels, identifying cost drivers, and placing emphasis on the activities that drive costs.

Figure 1: Conceptual Framework Economic order amount refers to the optimal quantity of a product that should be ordered in order to minimize inventory costs.

Procurement Performance can be measured by two key factors: Cost Reduction and Profit Maximization.

The Economic Order Quantity (EOQ) is a mathematical formula employed in inventory management to ascertain the optimal order quantity for a product, which reduces the overall expenses associated with inventory. The main goal of EOQ is to determine the optimal balance between the expenses associated with ordering and keeping inventory in order to ensure efficient management of inventory costs. The Economic Order Quantity (EOQ) is a fundamental principle in inventory management and plays a pivotal role in optimizing inventory levels for organizations (Mwangangi & Senelwa, 2018).

Demand forecasting is an essential procedure in business and supply chain management that entails predicting the future demand for a company's products or services. Having a thorough understanding of manufacturing, inventory, procurement, and overall business strategy is crucial for making well-informed decisions. Precise demand projections allow firms to efficiently satisfy consumer expectations, optimize inventory levels, minimize stock outs or overstock situations, and properly deploy resources. Data collection is the fundamental basis of demand forecasting. Valuable sources of information include historical sales data, client orders, market trends, and external factors

such as economic conditions, seasonality, and competition activity (Achevi, Juma & Otinga, 2021).

The reorder level, sometimes referred to as the reorder point or reorder threshold, is a vital term in the field of inventory management and supply chain management. The reorder point is the inventory threshold at which a corporation should initiate a replenishment order for a product to prevent stockouts prior to the arrival of the new order. The primary purpose of the reorder level is to mitigate the occurrence of stockouts and provide a consistent supply of items to satisfy consumer demand. Lead time refers to the duration required for a supplier to deliver a product subsequent to receiving an order. This encompasses the duration required for order processing, manufacturing (if applicable), and shipping. Precise calculation of lead time is essential for determining the reorder level (Korir, Kaitany & Sang, 2021).

Activity Based Costing (ABC)

Activity-Based Costing (ABC) is a contemporary accounting technique employed by firms to assign indirect costs to products, services, or activities according to their real utilization of resources. Contrary to conventional cost allocation approaches, which frequently depend on general averages and may not precisely represent the actual cost drivers, Activity-Based Costing (ABC) offers a more precise and detailed perspective on the locations where costs are generated. ABC (Activity-Based Costing) is especially advantageous in sectors that have a wide range of products or services, intricate operations, or where overhead costs make up a substantial proportion of overall expenses. The core of ABC is identifying and analyzing different activities that utilize resources inside an organization. The activities encompass both direct and indirect work, spanning from machine setup, quality control, and material handling to administrative duties such as order processing and customer assistance. Every activity is allocated a cost driver, which is a quantitative measure that indicates the extent of activity usage, such as machine hours, labor hours, or the quantity of orders processed (Ezeala, Nzewi & Tochukwu, 2022).

ABC encompasses multiple essential stages. Initially, companies ascertain and delineate the activities that contribute to their operations. Next, they identify the factors that influence the costs of each activity. After establishing these pieces, the business gathers data on the specific utilization of resources by various goods, services, or projects. Subsequently, ABC computes the cost per unit of the selected cost driver for every action. The cost rate is



thereafter employed to assign overhead costs to certain products or services (Oseifuah, 2019). ABC (Activity-Based Costing) offers a more exact understanding of the actual cost structure of

products or services by aligning expenses more accurately with the activities that cause them (Ezeagba, 2018).

Table 1: Economic Order Quantity and Procurement Performance

	Mean	Std. Dev.
EOQ models are seen as a valuable tool for optimizing procurement performance, helping manufacturing companies to maintain competitiveness in the market	3.996	0.865
Manufacturers have leveraged EOQ principles to achieve cost savings in procurement, which has positively impacted their overall profitability.	3.819	0.945
The use of EOQ has enhanced collaboration with suppliers among large manufacturing companies fostering stronger relationships and more reliable procurement processes	3.798	0.611
EOQ models have enabled manufacturing companies to make informed decisions regarding reorder points, resulting in reduced emergency orders and associated costs."	3.731	0.908
By implementing EOQ strategies, manufacturing companies have witnessed improved cash flow management	3.711	0.776
EOQ calculations have contributed to reduced procurement lead times, allowing manufacturers to respond promptly to market demands and fluctuations	3.675	0.897
OQ models are seen as a valuable tool for optimizing procurement performance, helping manufacturing companies to maintain competitiveness in the market	3.613	0.786
Aggregate	3.732	0.841

An analysis of the relationship between Activity Based Costing and procurement performance. The study's second particular purpose was to determine the impact of activity-based costing on the procurement performance of major industrial enterprises in India. The participants were asked to express their level of agreement about different claims concerning activity-based costing and the procurement performance of major manufacturing enterprises in India, India. A 5-point Likert scale was employed, with 1 representing significant disagreement, 2 representing disagreement, 3 representing neutrality, 4 representing agreement, and 5 representing strong agreement. The findings were displayed in Table 2. Based on the findings, the participants concurred that implementing Activity-Based Costing (ABC) has furnished our organization with a more precise and detailed perspective on procurement expenses. This is corroborated by an average of 4.168 with a standard deviation of 0.905. Furthermore, the data reveals that the respondents, with a mean of 3.959 and a standard deviation of 0.885, expressed agreement about the identification of certain cost drivers within our procurement procedures through ABC. This has

allowed us to deploy resources in a more efficient manner. Moreover, the participants concurred that ABC has enhanced our capacity to evaluate supplier performance by comprehensively grasping the expenses linked to each provider. This is demonstrated by a mean value of 3.920 with a standard deviation of 0.605. The respondents also concurred that the use of ABC has allowed them to achieve a competitive edge in the manufacturing sector in India by optimizing procurement costs. This is demonstrated by a mean value of 3.915 with a standard deviation of 0.981. The participants concurred that ABC has enabled them to make well-informed decisions during supplier negotiations, leading to cost reductions and improved contractual conditions. This is corroborated by an average of 3.911 with a standard deviation of 0.873. Furthermore, the data indicates that the respondents, with a mean of 3.897 and a standard deviation of 0.786, agreed that their procurement team has effectively utilized ABC data to create a sourcing plan that is more economical for acquiring materials and components.

Table 2: Activity Based Costing and Procurement Performance

	Mean	Std. Dev.
The adoption of Activity-Based Costing (ABC) has provided our company with a more accurate and granular view of procurement costs.	4.168	0.905



Through ABC, we have identified specific cost drivers within our procurement processes, enabling us to allocate resources more efficiently	3.959	0.885
ABC has improved our ability to assess supplier performance based on a comprehensive understanding of the costs associated with each supplier	3.920	0.605
By implementing ABC, we have gained a competitive advantage in the manufacturing sector by optimizing procurement costs.	3.915	0.981
ABC has allowed us to make informed decisions when it comes to negotiating with suppliers, resulting in cost savings and better terms	3.911	0.873
Our procurement team has leveraged ABC data to develop a more cost-effective sourcing strategy for materials and components	3.897	0.786
Aggregate	3.886	0.858

Procurement Performance of Large Manufacturing Companies

The participants were asked to express their level of agreement about different claims concerning the procurement performance of major manufacturing enterprises in India. A 5-point Likert scale was employed, with 1 representing significant disagreement, 2 representing disagreement, 3 representing neutrality, 4 representing agreement, and 5 representing strong agreement. The outcomes were as displayed in Table 3.

Based on the findings, the participants concurred that the firm exhibits robust financial success, encompassing both revenue expansion and profitability. This is corroborated by an average of 4.084 (standard deviation = 0.997). Furthermore, the data reveals that the respondents, with a mean of 3.917 and a standard deviation of 0.831, unanimously acknowledged that the business

routinely surpasses client expectations in terms of product quality, availability, and delivery. In addition, the respondents concurred that the company proficiently oversees production and distribution operations to guarantee punctual delivery and limit any occurrences of delays or stock outs. This is demonstrated by a mean value of 3.858 with a standard deviation of 0.563. The respondents also concurred that the corporation upholds robust ties with clients and suppliers to cultivate collaboration and bolster long-term economic prosperity. This is demonstrated by a mean value of 3.831 with a standard deviation of 0.851. In addition, the participants concurred that the company consistently evaluates and enhances key performance indicators (KPIs) pertaining to production, efficiency, and cost management. This is demonstrated by a mean value of 3.787 with a standard deviation of 0.897.

Table 3: Procurement Performance of Large Manufacturing Companies

	Mean	Std. Dev.
The organization demonstrates strong financial performance, including revenue growth and profitability.	4.084	0.997
The organization consistently meets or exceeds customer expectations in terms of product quality, availability, and delivery.	3.917	0.831
The organization effectively manages production and distribution processes to ensure on-time delivery and minimize delays or stock outs.	3.858	0.563
The organization maintains strong relationships with customers and suppliers to foster collaboration and support long-term business success.	3.831	0.851
The organization continuously monitors and optimizes key performance indicators (KPIs) related to productivity, efficiency, and cost management.	3.787	0.897
Aggregate	3.831	0.876

V. CONCLUSIONS

Furthermore, the study establishes that the economic order quantity has a favorable and substantial impact

on the procurement performance of major manufacturing firms in India. The study uncovered insights into demand forecasting, re-order levels, and holding. The cost factor significantly impacts the procurement performance of major industrial



enterprises located in India. The study also determines that activity-based costing has a favorable and substantial impact on the procurement performance of major industrial enterprises in India. The study found that inventory optimization, cost drivers, and attention on activities have an impact on the procurement performance of large manufacturing enterprises in India.

Suggestions

According to the results, this study suggests that large industrial enterprises in India should integrate EOQ calculations into their procurement processes. Optimizing inventory management involves ordering the appropriate amount of commodities at the optimal time, reducing carrying costs, and limiting stock outs.

It is advisable for companies to develop and periodically assess reorder points to verify their alignment with demand patterns. When deciding on reorder levels, it is important to take into account issues such as lead time, fluctuation in demand, and the need for safety stock. Modify these values as required to avoid both stock outs and overstock problems.

Recommendations for Further Academic Pursuits

This study aimed to investigate the impact of inventory management strategies on the procurement performance of major manufacturing enterprises in India. Due to the focus on procurement performance of large industrial enterprises in India, the results of this study cannot be applied to the performance of other firms in India. Hence, the paper proposes conducting additional research to investigate the impact of inventory management systems on procurement performance in other Indian companies.

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