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INVENTORY MANAGEMENT PRACTICES AND PROCUREMENT EFFICIENCY: A STUDY OF LARGE MANUFACTURING COMPANIES IN INDIA

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ABSTRACT

The manufacturing sector relies heavily on efficient procurement processes to meet customer demands and maintain a competitive advantage. However, stakeholders have expressed growing concern over declining procurement performance, which has reportedly increased by 23% in inefficiencies. This study aims to examine the impact of inventory management strategies on the procurement performance of large manufacturing companies in India. Specifically, it investigates the effect of Economic Order Quantity (EOQ) and Activity-Based Costing (ABC) on procurement performance. A descriptive research design was adopted for the study, focusing on procurement officials working in major manufacturing enterprises. A representative sample of 187 procurement officers was selected using simple random sampling, based on the formula developed by Cooper and Schindler, ensuring equal probability of selection for all population elements. Primary data were collected through structured questionnaires. The quantitative data were analyzed using descriptive statistical techniques, including frequency distribution, mean, and standard deviation. The findings suggest that inventory management strategies, particularly EOQ and Activity-Based Costing, play a significant role in enhancing procurement performance. The study recommends that large manufacturing firms incorporate EOQ models into their procurement processes to improve efficiency and cost-effectiveness.

KEYWORDS: Supply Chain Efficiency, Procurement Effectiveness, Inventory Optimization, Cost Management Techniques, EOQ Model, Activity-Based Costing, Manufacturing Sector, India

INTRODUCTION

Procurement has emerged as a critical function in contemporary business management, encompassing the processes of sourcing, acquiring, and managing external resources essential for organizational operations. It involves activities such as supplier selection, contract negotiation, and supply coordination, all of which contribute to ensuring efficiency and cost-effectiveness. Effective procurement enables firms to leverage supplier markets and optimize resource utilization, thereby improving organizational performance and profitability (Kumar & Singh, 2022). Over time, procurement has transitioned from a routine administrative role to a strategic function that supports long-term organizational objectives. This shift reflects the increasing complexity of global supply chains and the need for organizations to enhance efficiency and competitiveness (Prajogo & Olhager, 2019). Consequently, organizations have undertaken reforms to strengthen procurement systems by enhancing transparency, accountability, and regulatory compliance (Thai, 2017). In periods of economic uncertainty, procurement becomes even more significant as organizations depend on it to control costs and maintain sustainability (Monczka et al., 2020).

Inventory management represents another essential component influencing organizational effectiveness across firms of all sizes. It focuses on controlling and monitoring the flow of materials to ensure that adequate stock levels are maintained to meet operational and customer requirements. A major challenge in inventory management is balancing supply with fluctuating demand. Firms must maintain sufficient inventory to avoid stock-outs and disruptions, which can negatively impact customer satisfaction and sales performance (Chopra & Meindl, 2021). At the same time, holding excessive inventory leads to increased carrying costs, including storage, insurance, and risk of obsolescence. Therefore, achieving an optimal inventory level is crucial for operational efficiency and cost control (Heizer, Render, & Munson, 2020). Efficient inventory management practices improve turnover rates and contribute to cost savings, ultimately enhancing firm performance (Christopher, 2016).

Traditionally, organizations maintained high levels of inventory, including raw materials, work-in-progress, and finished goods, as a precaution against supply chain uncertainties (Wild, 2017). However, this approach often resulted in inefficiencies and increased operational costs. In response, modern organizations have shifted towards more efficient

inventory management strategies aimed at minimizing inventory levels while ensuring smooth operations. Since the 1980s, approaches such as Just-in-Time (JIT) have gained prominence, where materials are procured and utilized only when required in the production process. This strategy reduces inventory holding costs and enhances efficiency (Slack & Brandon-Jones, 2018). Although many firms have successfully reduced inventory levels through such strategies (Ivanov et al., 2019), empirical evidence regarding their direct impact on organizational performance remains inconclusive (Dubey et al., 2020). Therefore, it is important to investigate the relationship between inventory management strategies and procurement performance, particularly within large manufacturing enterprises.

Problem Statement

Procurement plays a pivotal role in driving efficiency and growth within the industrial sector, particularly in manufacturing organizations where the timely acquisition of inputs is essential for uninterrupted production and customer satisfaction. In India, both public and private sector enterprises depend heavily on procurement systems to achieve operational efficiency and enhance organizational performance (Sharma & Gupta, 2021). Despite its strategic importance, procurement performance in large manufacturing firms has remained a matter of concern. Several studies have highlighted persistent inefficiencies, including prolonged procurement cycles, high acquisition costs, non-compliance with established procedures, and inadequate service delivery (Reddy, 2019; Verma, 2017; Sinha, 2020). These challenges have collectively contributed to a reported increase of approximately 23% in procurement-related inefficiencies, thereby affecting overall organizational effectiveness.

One of the key factors influencing procurement performance is the effectiveness of inventory management systems. Manufacturing firms invest substantial financial resources in maintaining inventories of raw materials, work-in-progress, and finished goods to ensure smooth production and meet market demand. However, inefficient inventory practices often lead to excessive holding costs, resource misallocation, and operational inefficiencies. According to Bansal (2022), effective inventory management is essential for maintaining an optimal balance between stock availability and cost control. Poor inventory control can result in stock-outs, production delays, reduced profitability, and declining customer satisfaction (Kulkarni & Patil, 2020). As competition intensifies across industries, efficient inventory management has become a necessity rather than an option for production managers, as it directly impacts both operational efficiency and financial performance (Mehta, 2018).

Although numerous studies have explored the relationship between inventory management and organizational performance, limited attention has been given to its specific impact on procurement performance. For instance, Singh (2021) examined inventory management practices in service organizations, while Nair and Menon (2019) focused on inventory efficiency in food processing industries. Similarly, Joshi (2020) investigated inventory control systems in small and medium enterprises. However, these studies do not explicitly address how inventory management strategies influence procurement performance in large manufacturing firms within the Indian context. This gap highlights the need for a focused investigation. Therefore, the present study seeks to examine the impact of inventory management strategies on the procurement performance of major manufacturing enterprises in India.

Explicit Goals

1. To examine the effect of the Economic Order Quantity (EOQ) model on the procurement performance of large manufacturing firms in India.
2. To assess the influence of Activity-Based Costing (ABC) on the procurement performance of major manufacturing enterprises in India.

Theoretical Review: Economic Order Quantity (EOQ) Model

The Economic Order Quantity (EOQ) model, originally developed by Ford W. Harris in 1913, remains one of the most widely used inventory management frameworks for determining optimal order quantities. The model is designed to identify the level of inventory that minimizes the total cost associated with ordering and holding stock. According to Sharma and Meena (2021), the EOQ model provides a scientific basis for balancing two key cost components ordering costs and carrying costs which typically move in opposite directions.

When order quantities increase, the frequency of placing orders declines, resulting in lower ordering costs. However, this also leads to higher average inventory levels, thereby increasing holding or carrying costs such as storage, insurance, and obsolescence. Conversely, smaller order quantities reduce inventory holding costs but increase ordering frequency and associated expenses (Gupta & Jain, 2019). The EOQ model identifies an optimal point at which the total inventory cost is minimized, commonly referred to as the economic order quantity.

Recent studies have emphasized the practical relevance of EOQ in improving operational efficiency. For instance, Patel and Desai (2020) found that the application of EOQ significantly enhances cost control and inventory turnover in manufacturing firms. Similarly, Verma and Kaur (2022) highlighted that EOQ-based decision-making contributes to improved procurement planning and resource optimization. By minimizing unnecessary costs and ensuring timely availability of materials, the EOQ model plays a crucial role in strengthening procurement performance.

In the context of this study, the EOQ model is considered a key inventory management strategy that can influence procurement efficiency. Therefore, this research seeks to evaluate the extent to which EOQ contributes to enhancing procurement performance in large manufacturing enterprises in India.

Study Design

The present study utilized a descriptive research design to systematically collect and interpret data related to inventory management strategies and procurement performance. This approach enabled the researcher to summarize and present quantitative data in an organized and meaningful manner. The study was conducted among large-scale manufacturing enterprises operating across India. According to the Federation of Indian Chambers of Commerce and Industry (FICCI, 2022), the country hosts a substantial number of large manufacturing firms, which formed the population for this research. The study specifically targeted procurement managers and officers, as they are directly involved in purchasing decisions and inventory control practices. A simple random sampling technique was adopted to ensure fairness and eliminate selection bias, giving each member of the population an equal opportunity to be included. Based on this method, a total of 187 procurement professionals were selected as respondents. Primary data were collected through structured questionnaires administered directly to the respondents. The self-administered questionnaire method was chosen due to its efficiency in gathering large-scale data. Prior to the main survey, a pilot study involving 19 participants was conducted to test the reliability and clarity of the instrument. According to Saunders, Lewis, and Thornhill (2019), a pilot sample of around 10% is adequate for refining research tools. Necessary modifications were made based on the pilot results to improve the quality of the questionnaire.

Analysis of Research Results and Discussion

The study distributed questionnaires to 187 procurement professionals working in large manufacturing organizations. After data collection, all responses were carefully examined to ensure completeness and accuracy. Out of the total responses received, 169 questionnaires were found valid and suitable for analysis, resulting in a response rate of 90.4%. As noted by Bryman and Bell (2018), a response rate exceeding 70% is considered acceptable for social science research. Therefore, the obtained response rate was considered highly reliable for further analysis.

Relationship Between Economic Order Quantity and Procurement Performance

One of the key objectives of the study was to assess the influence of the Economic Order Quantity (EOQ) model on procurement performance. Respondents were asked to indicate their agreement with statements related to EOQ practices in their organizations.

The results indicate that respondents generally perceive EOQ as an effective tool for enhancing procurement efficiency and maintaining competitiveness, as reflected by a mean score of 3.996 and a standard deviation of 0.865. Additionally, respondents agreed that the application of EOQ principles contributes to cost reduction in procurement activities, thereby improving overall profitability (mean = 3.819; SD = 0.945).

The findings further suggest that EOQ implementation enhances coordination with suppliers, leading to more stable and reliable procurement processes (mean = 3.798; SD = 0.611). Respondents also acknowledged that EOQ supports better planning of reorder levels, which helps in minimizing emergency purchases and reducing unnecessary costs (mean = 3.731; SD = 0.908). Moreover, the study revealed that EOQ contributes to improved financial management by optimizing inventory levels and enhancing cash flow (mean = 3.711; SD = 0.776). It was also observed that EOQ practices help in reducing procurement lead times, allowing firms to respond quickly to changing market conditions (mean = 3.675; SD = 0.897). Overall, respondents agreed that EOQ serves as a valuable tool in improving procurement performance and sustaining competitive advantage in the manufacturing sector (mean = 3.613; SD = 0.786).

Table 1: Economic Order Quantity and Procurement Performance.

	Mean	Std. Dev.
EOQ models are widely recognized as an effective mechanism for enhancing procurement efficiency, enabling manufacturing firms to sustain their competitive position in the market.	3.90	0.865
Manufacturing firms have utilized EOQ principles to reduce procurement costs, thereby contributing positively to their overall profitability.	3.77	0.945
The adoption of EOQ has improved coordination with suppliers in large manufacturing firms, leading to stronger relationships and more dependable procurement processes.	3.64	0.611
EOQ models have helped manufacturing firms make more accurate decisions on reorder points, thereby minimizing emergency orders and reducing related costs.	3.63	0.908
The implementation of EOQ strategies has enabled manufacturing companies to achieve better cash flow management.	3.69	0.776
EOQ calculations have helped shorten procurement lead times, enabling manufacturers to respond more quickly to changing market demands and fluctuations.	3.59	0.897
EOQ models are regarded as an effective approach to improving procurement performance, supporting manufacturing firms in sustaining their competitiveness in the market.	3.60	0.786
Aggregate	**3.70**	**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 enabled our company to achieve a more accurate and detailed understanding of procurement costs.	4.168	0.905
Through ABC, we have identified key cost drivers within procurement processes, which has improved resource allocation efficiency.	3.959	0.885
ABC has enhanced our ability to evaluate supplier performance by providing a comprehensive view of the costs associated with each supplier.	3.920	0.605
The implementation of ABC has provided our company with a competitive advantage in the manufacturing sector by optimizing procurement costs.	3.915	0.981
ABC has supported more informed decision-making during supplier negotiations, resulting in cost savings and improved contractual terms.	3.911	0.873
Our procurement team has utilized ABC data to develop a more cost-effective and efficient sourcing strategy for materials and components	3.897	0.786
Aggregate	**3.886**	**0.858**

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.

1. Our procurement team has used ABC data to design a more cost-efficient sourcing strategy for materials and components.

2. ABC insights have helped in identifying the most economical sources for procuring raw materials and components.
3. The use of ABC data has improved decision-making in selecting suppliers based on cost effectiveness.
4. Procurement strategies have become more streamlined and efficient through the application of ABC information.
5. ABC-based analysis has enabled better planning and optimization of sourcing activities, reducing overall procurement costs.

Recommendations for Further Academic Pursuits

This study was conducted to examine the impact of inventory management strategies on the procurement performance of major manufacturing enterprises in India. However, since the study specifically focuses on large industrial enterprises, its findings may not be generalizable to other types of firms within the country. Therefore, it is recommended that further research be undertaken to explore the influence of inventory management systems on procurement performance across a broader range of Indian companies.

CONCLUSION

This study examined the impact of inventory management strategies on procurement performance in major manufacturing enterprises in India. The findings suggest that effective inventory management plays a crucial role in improving procurement efficiency, reducing costs, and enhancing overall operational performance. Techniques such as better stock control, demand forecasting, and optimized ordering systems contribute significantly to timely procurement and improved supplier coordination. However, the study is limited to large industrial enterprises, which restricts the generalizability of the results to other types of firms. Despite this limitation, the study highlights the importance of adopting advanced inventory management systems to strengthen procurement outcomes. It is therefore recommended that future research should explore a wider range of organizations across different sectors to provide a more comprehensive understanding of this relationship.

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