

INVENTORY MANAGEMENT: METHODS, APPROACHES, BENEFITS AND CHALLENGES

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ABSTRACT

Inventory control is a subdiscipline in the broad field of supply chain management, and it deals with the control of stock of items in a business. The information presented in this work is a synthesis of the current approaches to inventory management, along with the advantages and disadvantages concerning this issue. The main approaches to inventory control and management discovered in the literature review are JIT, EOQ, and ABC analysis. JIT focuses on manufacturing only as many units as are currently required avoiding pilferage along the predefined supply chain; EOQ on the other hand applies a theoretical balancing by identifying the most appropriate quantity to order to avoid high costs. ABC analysis helps to classify inventory by its value and level of priority to optimize resource distribution. The advantages of good stock management are great and include reduced holding costs, increase in cash flow from minimizing on stocks held, and customer satisfaction arising from the improved holding of stocks. But problems remain; demand forecasting is a challenge as is the handling of multiple inventory types, the costs and issues of applying new technologies for inventory management are also challenging. This specific review engages both peer-reviewed literature and the “grey” literature from leading databases and conference proceedings incorporating string search and snowballing technique for overall comprehensive understanding of the topic. The implications drawn from the research show the importance for managerial adaptation especially to business inventory that require optimization in efficiency as well as the utilization of technology to overcome the inherent flaws. This is why sustained research and development of materials concerning inventory management are critical to business operations in the context of a dynamic environment.

Keywords: Inventory, Management, Methods, Benefits and Challenges

1.0 INTRODUCTION

Inventory control is a crucial component of a company’s processes since the tracking and monitoring of non-fixed assets and inventory is a significant and essential component. It helps organizations to make the right quantities of goods at the right periods to make it easily accessible to patrons at a minimal cost. Inventory management is a crucial tool that determines the proper relationship between supply and demand, optimal costs of storage, and the general organizational performance.

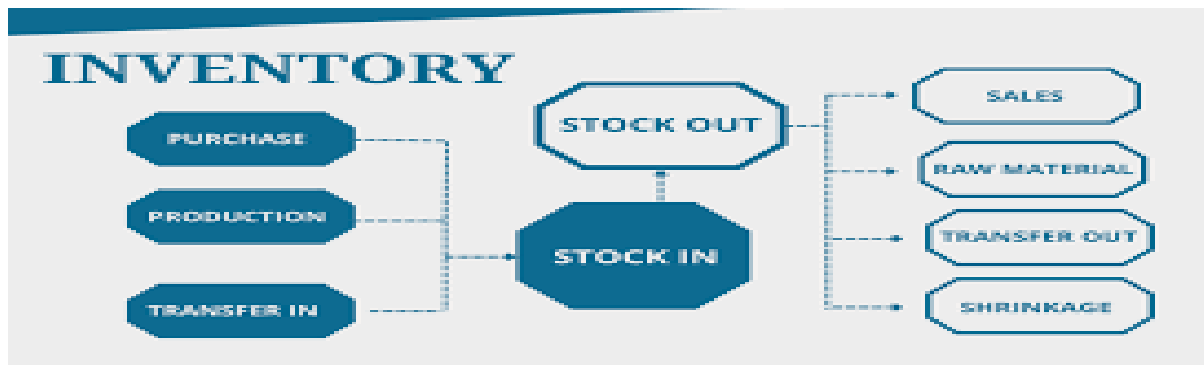


Figure 1: Inventory management

1.1 Methods of Inventory Management

The following are the approaches used in inventory management: The common methods include the following; Just in Time (JIT) is another method, which is an attempt to minimize the costs of holding inventories by purchasing merchandise only when required in the manufacturing technique. This approach helps in reducing wastage, and at the same time, it's effective, but it has the condition that the number of units to be ordered must be forecasted correctly and the suppliers must be trustworthy. Another technique is the economic order quantity (EOQ) where an organization ushers the maximum order quantity that keeps the overall costs at an all-time low due to frequent ordering and holding costs. EOQ ensures that companies avoid the pitfalls of ordering frequently, which raises the cost of holding the inventory, or the holding a large inventory, which increases the ordering cost. The ABC analysis method classifies inventory into three categories: Knowing the classifications, we have high valued products with low turnover, moderate valued products with moderate turnover, and low valued products with high turnover, represented by A, B, and C respectively. This categorization enhances the efficiency of managing working capital as it directs the attention of the business to the most essential inventory elements.

1.2 Benefits of Inventory Management

Many advantages can be derived from effective stock control such as, inventory and cash acquisition. This way, firms can cut on the costs incurred in storage, avoid situations where there is no stock or rather there is excess stock as well as avoid instances where capital is tied up in inventory. These translate in better cash flows and hence better profitability of the organization. Further, inventory management also helps to increase customers' satisfaction. Appropriate stocks management make sure that the products are in the right place and right time when the customers want to make a purchase thereby cutting down on lead time and lost sales due to stock out. If the customers are happy with the product, they will be willing to come back and purchase more products in the future, which aids in the permanent success of the business. Inventory management also assists in decision making since it offers the management the necessary information concerning stock levels. Sophisticated tracking technologies allow businesses to get near real-time information about the inventory situation that can help to make more knowledgeable decisions about what, when, and how much to buy and produce, as well as the sales plans. KPIs help to make the company's decision-making data

driven which translates to better demand forecasting, right resource utilization and overall efficiency.

1.3. Challenges of Inventory Management

However, there are some difficulties of inventory management that should be considered. The first major category of challenges is demanding forecasting. To a certain extent, it is quite challenging to achieve a high level of accuracy when forecasting customer demand, and this might result in either overstocking or running out of stock. Both scenarios are costly: too much stock holds capital and incurs more expenses on warehousing, whereas, out of stock causes loss in potential sales and customer dissatisfaction. That is why supply chain management is another challenge that learners may encounter as they engage in professional practice. Today's supply chains are complex and cannot be limited to local players but rather have networks of suppliers, manufacturers, and distributors. Synchronizing these elements ensures that the delivery of inventory occurs in the right time and without much mistake, this needs strong systems and processes. These disruptions make it clear that any interruptions in the supply chain processes can result in delays and impact inventory control and should therefore be assessed adequately. Inventory management also includes keeping records of quantities held in stock at any given time. Traditional methods of tracking inventory involve the use of manual processes with high chances of inaccuracy hence there is always a difference between the actual stock and the recorded one. Automating the processes of inventory management also minimizes mistakes, however, utilizing such systems costs a considerable amount of money and requires further support. Also, there are the costs of storing inventory and handling expenses that must be incurred by businesses. The cost of renting a warehouse, hiring people to manage it, and transportation also pose a problem to the organization due to the high amount of stock handled. Ideally the methods of stocks storage and the cost of the same are manageable but it needs to be implemented in the warehouse to avoid problems.

Managing inventory is important in any business process; and retailing involves several techniques used in managing stock. Hence, it provides several benefits, including increased cash flow, satisfied customers, and enhanced decision-making while also being currently associated with demand forecasting, supply chain, and cost. This paper aims at outlining key challenges affecting effective inventory management and how these challenges can be prevented or mitigated so as to result in lasting business solutions.

2.0 REVIEW OF LITERATURE

Inventory control is a sub-discipline of the field of supply chain management, which targets the tracking of goods, material, and products that an organization stocks in its store. Inventory management is the process through which firms guarantee they have enough stock to fulfil the demand of their customers and at the same time reduces the costs of managing the stocks.

2.1. Methods of Inventory Management

Many procedures are used in managing and maintaining inventories. Some of the prominent methods are: Just in Time (JIT), Economic Order Quantity (EOQ) and ABC analysis.

a. Just-in-Time (JIT): Part of JIT is the inventory management strategy whose goal is to acquire inventory when it is most required in the manufacturing process to lower inventory costs (Chase, Jacobs & Aquilano, 2004). This procedure is sensitive to demand forecasts and good relations with the suppliers to function well (Fullerton, McWatters, & Fawson, 2003).

b. Economic Order Quantity (EOQ): EOQ is an acronym for the method that is used to find out the right order quantity which eliminates the cumulative cost of holding inventory and cost of ordering. The EOQ model enlightens organizations on how to manage the tradeoff between order cycle and carrying costs (Harris, 1913).

c. ABC Analysis: This procedure involves classification of inventory in three groups; Class A, Class B and Class C depending on the importance and value of the stocks. 'A' item is considered as most strategic and thus should be closely monitored, 'B' items are moderately valuable, and 'C' items are non-critical and do not need much attention (Vrat, 2014).

2.2 Benefits of Inventory Management

Proper management of inventory has several benefits, for example, it can reduce the cost of carrying stocks by identifying the most efficient stock level for a particular product and thus cutting the overall cost of holding stock; it can also lead to better control of cash flow for a business; and last but not the least, it can help in increasing customer satisfaction level.

a. Cost Savings: Through holding the inventory at the right level, business organizations prevent the costs of holding excess inventory, including insurance cost, time and space cost among others (Gaur & Raman, 2005). JIT for instance, cuts storage costs and prevents accumulation of perishable stock by restocking in proportion to the rate of the manufacturing process (Fullerton, 2003).

b. Improved Cash Flow: Effective management of inventories imply that capital is not locked up in inventories hence enhancing cash flow. For instance, EOQ allows a firm to hold as little cash in inventory as possible while fulfilling customers' demand (Harris, 1913).

c. Enhanced Customer Satisfaction: Ensuring there are the right products in inventory to suit the consumers' needs means businesses get better at servicing customers' needs hence enhancing their satisfaction and loyalty (Vrat, 2014). Effective inventory management reduces the occurrence of stockouts and therefore, control of service levels (Chopra & Meindl, 2013).



Figure 2: Inventory Management key Techniques

2.3 Challenges of Inventory Management

However, like every other managerial function, inventory management comes with several hurdles which include the following: Demand forecasting: Inventory management is usually done with the hope that future demands will meet certain standards that will make it easy to complete the cycle. Management of diverse inventions: There are several types of inventories in any business, and thus, their management requires some consideration. Technological integration: Most businesses apply technology in the management of their inventories since it is usually considered

a. Demand Forecasting: It is usually important to note that the demand of goods has to be predicted well in order to enhance inventory control. Although, the forecast of customer demand remains difficult because of unforeseeable fluctuations in the market and cycles, change of seasons and shift of customers' preferences (Makridakis, Wheelwright & Hyndman, 1998). While working with demand forecasts, both stockout and excess stock business situations may occur due to inaccurate forecasts (Silver, 2016).

b. Managing Diverse Inventory: Another challenge that those organizations that have many products in their lineup are bound to encounter includes multi-SKU inventory. The ABC analysis aids in decision making concerning inventory management but the process of parceling out the demand of different types of products may sometimes entail a lot of controversies (Vrat, 2014).

c. Technological Integration: Some of the most useful and complex forms of inventory management systems like the Enterprise Resource Planning (ERP) systems, therefore come with difficulties and high expenses. These systems need considerable investment in training as well as technological apparatus and are contingent on the proper interaction of different business processes (Kumar & Suresh, 2009).

Even small businesses must pay great attention to the efficient management of inventory goods. Just in time or JIT, economic order quantities or EOQ and activity-based costing or ABC analysis are some of the ways through which inventory management can be affected, and each of these has its own advantages as well as disadvantages. Managing the inventory and keeping it to optimal means that there is a cutting on the expenses incurred, the flow of the cash is good, and customers are satisfied with what they get. However, there is demand forecasting, working with different types of stocks, and implementation of technologies among the significant challenges for businesses. Future studies and improvement in the application of inventory control strategies will enable organizations to continue competing favorably within the market environment.

3.0 METHODOLOGY

3.1 Aim

The aim of the study is to study in detail inventory management focusing on its methods, approaches, benefits and challenges.

3.2 Research Objectives

1. To comprehensively review and categorize different methods used in inventory management.
2. To compare various approaches such as Just-In-Time (JIT), Economic Order Quantity (EOQ), and Material Requirements Planning (MRP).
3. To quantify the positive outcomes of effective inventory management on business operations.
4. To understand the obstacles faced by businesses in adopting inventory management systems.

3.3 Research Methods

This study has adopted systematic and comprehensive narrative review and schematically analyzed the literature and integrated findings and voids in the current inventory management knowledge with regards to its methods, benefits, and challenges. This approach focused on identifying the 'best' solution, on which other successful solutions would be based; hence, it gave a broad outline of the problematic area under consideration. In a way, implementing this method helped to extract systematic necessary themes, concerns, as well as opportunities connected with inventory management. The study brought out more elaborate concepts, which enriched the topic in the emerging field of inventory management.

The data collection and analysis processes were done between 26 February and in April of the year 2024. Every paper selected in this analysis was carefully screened to ensure its relevance to the proposed study, and major research areas were carefully distilled. After that, these topics were aggregated and used to develop the research questions which served as the direction for the subsequent research. It led to the creation of a map of processes showing the possible effects of different inventory management techniques on the operation of the business.

4.0 DISCUSSION AND FINDINGS

4.1 Methods of Inventory Management

The review established that there are various techniques of inventory management that are widely discussed in literature; these are JIT, EOQ and ABC analysis.

Just-in-Time (JIT): JIT inventory controls demand for the acquiring of only what is necessary at the time of need so as to significantly minimize the costs of carrying stocks (Chase, Jacobs, & Aquilano, 2004). The strategy is highly dependent on accurate demand forecasts and good relations with suppliers to be effective (Fullerton, McWatters, & Fawson, 2003).

Economic Order Quantity (EOQ): It is a formula that helps to identify the most appropriate order quantity that helps the company to minimize the costs of holding the inventories and costs of ordering. The EOQ model assists the firms in dealing with the interactive effect between the frequency of ordering and carrying costs (Harris, 1913).

ABC Analysis: This method groups stock items into three classes; Class A stock, Class B stock, and Class C stock according to their priority and usefulness. Whereas 'A' items are considered

as highly important, or of high value and hence need to be controlled stringently; 'B' items are moderately important or value; and 'C' items are least important or of low value, and therefore do not need much management (Vrat, 2014).

4.2 Benefits of Inventory Management

The advantages of efficient inventory management are numerous: The company will save money as they will not need to buy inventory that is not selling; they will have better cash flow, which also contributes to better customer satisfaction. Cost Savings: First, there is risk of holding excess inventory that tends to increase costs in storage, insurance, and some may become obsolete as was pointed out by number of authors including Gaur, Fisher and Raman (2005). For example, JIT reduces the cost of storing expensively and eliminates wastage through coordinating the amount of inventory with the rate of production per period (Fullerton et al., 2003). Improved Cash Flow: Effective and efficient storage and use of inventory makes it possible for capital to be utilized effectively by preventing the locking up of capital in stock. For instance, EOQ supports companies in reducing the quantity of cash that may be tied to inventory but not demand (Harris, 1913). Enhanced Customer Satisfaction: Thus, the proposition of the right product that meets the consumer demands can be more efficient, enhancing customer satisfaction and loyalty (Vrat, 2014). Optimal inventory levels also mean that there will be few stockouts hence service level will always be maintained (Chopra & Meindl, 2013).

4.3 Challenges of Inventory Management

However, there remain some hurdles that inventory management presents when used in an organization, and these include demand forecasting, handling of variably type inventories, and technological compatibility. Demand Forecasting: Demand forecasting is vital to inventory management so that the right amount of stock in the required product is available at the right time. However, estimating customer demands can sometimes be difficult given variability that is common in most markets, and availability of products depending on the season, or shifting customer preference. Normally, if demands are not well estimated, this may lead to situations where some product inventory is out of stock or conversely, there is an overstock of products (Silver, Pyke, & Thomas, 2016). Managing Diverse Inventory: Merchants whose organizations deal with different types of products always have problems with managing stocks. ABC analysis assists in focusing on critical inventory management, although, the high-level replenishment benefits may present various challenges to allocating priority balanced with other product categories (Vrat, 2014). Technological Integration: Main authors state that the introduction of more sophisticated inventory management systems, for example, ERP systems is difficult and can be expensive. These systems are costly and need investments in hardware and software as well as in training of the employees and their success also depends on the effective implementation of the business processes (Kumar & Suresh, 2009).

5.0 CONCLUSION

Inventory management is a crucial success factor in any business as it can help a business meet customers' needs with the maximum inventory turnover and costs at a minimum. As a result of the distinctive focus of this study, which is an extensive narrative review, this paper finds it possible to explicate the general methods of inventory management, as well as its benefits and

challenges. Tools such as Just in Time (JIT), Economic Order Quantity (EOQ) and Activity-Based Costing (ABC) provide systematic ways of handling inventories. The evaluation also shows that each technique imposes unique benefits. JIT helps in reducing storage costs and expenses by keeping stock in accordance with the manufacturing processes while EOQ is a mathematical tool which helps in optimizing the ordering and holding costs. ABC analysis, on the other hand, helps in determining the priority of the businesses in its inventory control by categorizing items with high value importance. Together, these techniques combine to generate significant savings, efficient working capital, and high customer satisfaction stemming from the availability of products in-house at the right time. As you can see in the previous points, inventory management comes with some challenges. Another important element of the demand management process is demanding forecasting, which is used to predict future demand. This is a very important yet challenging task because of the frequent fluctuations in the market and changes in customer needs. Handling different types of inventories, as for different product ranges, is yet another challenge which may be encountered in companies selling products of various types. Furthermore, system-level integration with more advanced inventory systems like ERP incurs steep costs in both technological infrastructure and employee training that can prove a hindrance to most organizations. Finally, as we have seen, inventory management techniques such as JIT, EOQ and ABC analysis are as we have seen controllable techniques that help in management of inventory however, they face the following challenges in order to achieve the full optimization of the inventory systems. Further development of the new technologies and additional study on the previous findings to enhance the overall performance of the business will be pertinent in overcoming market challenges. The field of inventory management has continued to call for innovation and is still substantial to operations and overall organizational functionality.

6.0 FUTURE RESEARCH DIRECTIONS

In future some of the studies that can be pursued are

Studies can be undertaken to explore how emerging technologies such as AI, IoT, and blockchain can further optimize inventory management. Empirical studies, pilot projects, and case studies on the application of these technologies in inventory management can be undertaken. Further investigations can be conducted to ascertain how inventory management can be aligned with sustainability goals. Research on eco-friendly materials, circular economy practices, and carbon footprint reduction strategies in inventory management can be explored. In future the studies can be conducted based on case studies, scenario planning, and resilience modeling to analyze how global supply chain disruptions (e.g., pandemics, geopolitical tensions) affect inventory management.

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