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The Pros and Cons of Inventory Control Techniques and How They Impact Business Performance

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ABSTRACT

Every organization's performance is greatly impacted by inventory management. It is a crucial component of any company. It is the most valuable current asset in terms of finances and can be quickly turned into cash. As a result, every company needs to be able to control its inventory in accordance with its requirements and the demands of its clients. Additionally, holding more inventory than is necessary might raise the cost of carrying inventory since it takes up room in the warehouse. Therefore, it is crucial to maintain adequate stock—but not more than is necessary. However, some businesses struggle to strike a balance between their inventory supply and demand. Therefore, by identifying the shortcomings in the methods or systems used to manage the inventory, this research seeks to comprehend the concepts of inventory management and inventory control and to pinpoint the problems that businesses experience in their inventory management. To determine the goals, this study uses a qualitative data collection strategy using books, journals, and reliable websites.

1. **Introduction** :

Prempeh (2015) defines inventory management as the art and science of keeping stock levels at a low cost while achieving other goals and targets established by management; it is a key component of the system. A good inventory management system benefits the business in a number of ways, such as

fulfillment optimization, where efficient inventory storage speeds up and simplifies customer picking, packing, and shipping.

Additionally, preventing shrinkage—where purchasing an excessive amount of inventory can cause the goods to decay and become unusable—and having enough stock at the appropriate time in the correct location would improve the customer experience (Veeqo, 2022). Demand flexibility is one of the many circumstances in which holding inventory might be important. Demand fluctuations can be abrupt, obvious, and controlled. Thus, maintaining a safety supply ensures that clients are satisfied with the appropriate product at the appropriate time and location. In a similar vein, prices also fluctuate in addition to demand. Because purchasing in quantity typically results in a discount, the company would still have inventory on hand even if the price of a certain product changed. Not to mention, unreliable suppliers are a risk many firms attempt to avoid but cannot manage. This situation necessitates the rehabilitation or replacement of suppliers, which lowers the quantity of inventory on hand and guarantees the continuity of the material supply (Muller, 2019). However, keeping inventory can occasionally result in overstocking, which results in needless spending that doesn't produce revenue (Hassan, 2021).

Therefore, in order to make sure that their money is spent wisely, businesses should invest in a dependable inventory management system. Among the various factors that affect inventory management are financial factors like foreign exchange rates, suppliers such as unreliable suppliers, the lead time when local procurement is faster than international procurement but may be more expensive than international, product types, including perishables and non-perishables, and unexpected events that may arise. The effectiveness of an inventory management system is determined by all these elements, and as a company's assets influence its success, controlling them demands a strong feeling of responsibility.

2. **Literature Review:**

2.1 Factors Affecting Inventory Management

A number of factors can have an impact on the effectiveness of any inventory management system. Once these elements are discovered, the company can quickly accept the issue and start making the appropriate changes to avoid any more challenges or dangers that come along with such aspects (Madzivhandila, 2012). Knowing enough about "inventory management" is the most fundamental and important thing that directly affects inventory management. SMEs typically encounter these difficulties (Madzivhandila, 2012), but this does not imply that big businesses do not; they may be knowledgeable but yet employ antiquated methods and antiquated technology. or lack experts in this area, which can lead to data loss,

low productivity, incompatibilities, and many other problems (Vlad, 2022). To become a successful business with powerful competitive advantages in the market, organizations must have adequate funding. Without guaranteeing that they will be compensated for their products or services, suppliers are unable to supply inventory to an organization. Additionally, effective inventory management can lower additional costs related to inventory, such as warehouse operations, transportation charges, gasoline price fluctuations, etc. The utilization of technology is another crucial component. Logistics presently focuses around technology, meaning that there is technical assistance for every part of this business, including inventory. WMS, RFID, and other cutting-edge technology can be used to manage inventory. If businesses cannot afford these solutions, inventory management will be done by hand, which requires more personnel and time and may lead to overstocking or erroneous data. Unexpected events, such as economic crises, pandemics, etc., also directly affect inventory management. For instance, in Covid-19, many organizations failed to produce profit because to the difficulty of sourcing goods at the time, notably manufacturing. Additionally, according to Vergara et al. (2021), the variety of products offered and fluctuations in demand make inventory management extremely difficult for biosecurity product trading firms. Not to mention, many organizations, such as seaports and airports, are forced to stop operating to avoid spreading the disease even more, resulting in supply chain disruptions.

2.2 **Inventory Management Strategies:**

In order to manage inventory successfully and efficiently, methods or systems must be used. As a result, many approaches have been developed to handle various inventories. Inventory management may be made simpler for businesses and require less time and effort with the aid of cutting-edge technology and a suitable approach.

a) Inventory Management methods

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CATEGORY	**% OF INVENTORY ITEMS**	**% VALUE OF ITEMS**
A	5 – 10%	40 – 80%
B	20 – 30%	15 – 40%

C	50 – 70%	5 – 20%

Table 1: ABC Inventory Classification

This concept was first developed by the General Electric Company in 1951 to help managers monitor inventory consumption and control strategies (Bilgin and Tanyilmaz, 2021). However, other elements like lead time, suppliers, and consumption also have an impact on inventory value. Accordingly, it's critical to employ multi-criteria decision models so that managers can utilize several factors to assess the inventory's value (Bilgin and Tanyilmaz, 2021). The first stage in classifying each item is to find the price per unit of the manufactured or purchased item. Next, the number of units demanded for each item during the previous year is determined. The annual consumption value is then determined by calculating the price per unit and the usage rate. To make it simple to categorize each item into the appropriate category, they are then sorted in descending order and transformed into percentages (Afolabi et al., 2017). By identifying highly sought-after products and allocating more warehouse space for them and less for less sought-after items, the ABC analysis can improve inventory optimization. It can also enhance sales forecasting, providing managers with sufficient data to determine prices and inventory levels (Jenkins, 2020).

However, this approach can only be used internally because it disregards GAAP (Generally Accepted Accounting Principles) regulations. More significantly, it can result in losses because category B and C items are overstocked, which can lead to waste and/or damage (Merritt, 2019).

b) JIT (Just-In-Time)

JIT (lean production) is a Japanese concept first created Taiichi Ohno at Toyota in the 1970s (Mukwakungu et al., 2019). Manufacturing businesses are the primary users of this system, which strives to reduce waste of all types in order to increase production. By preserving consumer needs (demand), guaranteeing high-quality production, cutting costs, and eliminating resource waste, JIT aims to increase productivity. Additionally, it improves an organization's ability to provide services (Ndegwa, 2020). Even though it can cut waste, prior research has shown that it is not a perfect system and is not appropriate for every organization because inventory reduction expenses are not as high as those of other cost-cutting initiatives within the company (Madzivhandila, 2012).

Mostly this method is mainly implemented for very expensive commodities in the form of goods with higher purchase prices, ordering charges, and holding costs, but rarely demanded. Accordingly, since

there are no products in store, it is essential to guarantee that they will be supplied on schedule to prevent any costly or irreparable consumers as a result of delivery delays (Afolabi et al., 2017).

c) **VMI (Vendor Managed Inventory)**

Another word for direct replenishment that is frequently used by numerous firms to manage their inventory is VMI (Vendor Managed Inventory). According to Zhang (2005), VMI is used by more than 60% of industrial firms. In a nutshell, a vendor-managed inventory program involves suppliers monitoring their customers' warehouses and ensuring the efficiency of replenishing the inventory to achieve specific targets through a highly automated electronic messaging system.

Because suppliers are in charge of replenishment, they have a closer look at the organization's stocking, demand, and customer demand; as a result, they can easily forecast the number of inventories needed over each period. A VMI program can be used to reduce inventory management costs as well as the organization's purchasing by placing and monitoring orders by the suppliers immediately, coordinating a production plan along with safety stock and precise demand information, which is a win-win situation for both the suppliers and the organization (Zhang, 2005).

Therefore, a VMI program can assist in lowering a variety of risks associated with the supply process, including the frequency of orders and order returns, as well as last-minute orders, which can occasionally be expensive (DXP, 2019). However, since the supplier will be in charge of stocking the warehouse and will need access to the organization's data in exchange, which can be unsettling for many organizations, it can lead to a feeling of losing control. Furthermore, once a company commits to a VMI program, it will have limited options causing it to not be able to provide from other suppliers owing to the commitment it formed with a certain supplier (American Express, 2020).

d) **EOQ (Economic Order Quantity)**

Economic Order Quantity (the Wilson EOQ model) is used to graphically present the trade-offs between holding and ordering costs. It explains how to meet demand and refill inventory at a reasonable cost (Toles, 2018). In other words, EOQ determines the ideal quantity of inventory that an organization orders and adds to inventory at once with the goal of minimizing the annual inventory cost. It can help businesses operate more effectively, with the lowest inventory costs and no shortages, by determining the quantity and timing of orders (Moradizadeh, 2019). EOQ is computed using the following formula: $EOQ = \sqrt{((2 \times \text{Annual Demand} \times \text{Ordering Cost})/(\text{Carrying Cost}))}$ With this method, the inventory level is constantly monitored, and a set quantity is ordered when it reaches the reorder point, as depicted in figure (2) below. Moradizadeh (2019) claims that

EOQ is the oldest formula that has been effectively applied for a long time in the retail, pharmaceutical, marketing, and automotive industries. Since storing goods can be costly, the EOQ model helps businesses reduce holding and storage costs by suggesting the most cost-effective number of units per order. It is also business-specific, which means that the model gives precise figures for how much inventory to hold, when to reorder, and how much to order. However, the model is a complex mathematical computation that is mostly predicated on assumptions and necessitates a solid grasp of algebra (Harbour, 2019).

3. **Research Methodology:** -

Supplies and Procedures According to Jansen and Warren (2020), research methodology is essentially the "how" of any research publication; it refers to the approaches, techniques, and instruments the researcher utilized to carry out the research. This section explains the methodology used in the study and how information was gathered to find publications that were pertinent to it. The study's initial goals and research questions are as follows:

3.1 **Research objectives**:

- To determine what influences inventory control.
- To distinguish between different inventory management strategies.
- To research the impact of effective inventory control on business success.
- To determine how cutting-edge technologies are used in inventory management

.3.2 **Research Questions**:

RQ1. What are the factors affecting inventory management?

RQ2. What kinds of inventory management techniques are there?

RQ3. What are the effects of inventory control on the performance of the company?

RQ4. How are cutting-edge technologies used in inventory management?

The following step was to define the inclusion/exclusion criteria:

(1) Search limitations to papers,

(2) Take into account only English-language papers, and

(3) Exclusion of papers not accessible as full text.

For the next step, data collection, the keywords used were defined as Inventory Management, Companies performance, Inventory Control, and Effective Strategies. Then used to search them in online journals databases and scholarly databases (Emerald insights, Taylor and Francis Group) and Google Scholar. The keywords should be found in the paper title, paper keywords and/or paper abstracts. Then the papers were read to assess their relevance and contribution to the present study, and as a final step, the discussion of the findings for future work.

4. **Discussion:**

4.1 **Inventory Management's Impact on Business Performance**

As previously stated, inventory is a vital component of any business since it affects how well the business operates, regardless of whether it offers its clients products or services. As a result, controlling these factors can readily impact the organization's performance as well as its capacity to manage its stocks and cash flow. Inventory management, according to Sophia (2019), is the regulation of stock levels and their physical distribution in order to strike a balance between minimizing holding costs and boosting handling costs. Furthermore, with the increase of inventory problems throughout the years, technological progress also enhanced an organization's capacity to operate far more successfully and efficiently. Therefore, around the mid-80s, the benefits of inventory management planning, scheduling and production have become crystal clear to organizations.

Additionally, businesses as a whole never questioned how inventory management enhanced their operations. In order to maximize organizational efficiency and overall performance, inventory management is necessary. To put it briefly, inventory control is the process of obtaining, using, managing, and coordinating materials on hand to get the right goods, with the right quantity and quality, at the right place, at the right time. Having a system to manage it can have a direct or indirect impact on the organization's profitability. Therefore, a business will probably experience problems with profitability if it does not manage inventory effectively (Sophia, 2019).

A significant portion of an organization's shares, or roughly 40% of its capital, 33% of its assets, and 90% of its working capital, are invested in its inventories. Thus, the costs of overstocking or understocking should always be low, ensuring effective inventory control. Effective inventory management can also increase sales, which has a direct impact on the performance of the company. To do so, a system should be managed by a group of specialized employees who are experts in this scope (Sophia, 2019).

However, having the right technology or system to manage not only inventory but the warehouse in general can help businesses become the best in their industry and compete fiercely. This leads to lower handling costs and higher profits because of the system's efficient data and outcomes.

4.2 Usage of Advanced Technology in Inventory Management

These days, technology is becoming increasingly advanced, helping every sector to easily solve their issues, enhance their performance, or develop better plans with fewer errors. For instance, the goal of employing technology in inventory management is to replace any manual procedures or components that are typically laborious and prone to mistakes with an effective system that saves time, effort, and money (Internet Society, 2018).

4.2.1 Internet of Things (IoT)

The Internet of Things (IoT), a system that encompasses a vast array of networks, products, systems, and sensors, is the hot topic in the technology sector. In simple words, IoT refers to network connectivity and computing capability to objects or everyday items not usually considered computers, such as smart watches, smart bicycles, etc. (Rose et al., 2015). This system's main goal is to enable machines to function dynamically without human intervention.

RFIDs, for example, can facilitate communication and information exchange, enhancing the efficiency of the entire supply chain from the point of origin to the final consumer. It aids in lowering mistakes like supply errors, inventory loss, and inventory misplacement. RFID readers are connected to an internet terminal to identify, track and monitor items globally and automatically, which is a clear idea of IoT (Mashayekly et al., 2022).

4.2.2 System of Warehouse Management (WMS)

Warehouse Management Systems are widely used in the logistics industry, in both manufacturing and retail industries. The system tracks all goods that come into the warehouse and go out until it reaches the end user. In summary, it is used to optimize every process in the warehouse because it comes in various forms that make it much more user-friendly (Rittenberg and Watts, 2020).

- Integrated
- Standalone
- On-premises
- Cloud-based

WMS helps logisticians seamlessly order, store and ship goods by eliminating manual practices and using paper spreadsheets to track every action in the warehouse. In addition to its various varieties, the system can be pre-made with a number of features intended to address various issues or tailored to the needs of the users. This system's salient characteristics are as follows (Kholodenko, 2022):

- Importing, exporting goods
- Inventory information
- Order fulfilment
- Real-time tracking
- Picking and packing
- Billing and inventory

4.2.3 Barcode System :

Barcodes are an easy concept of assigning different items a unique value holding certain information about that specific item, and it is one of the most used and known types of technologies in inventory management due to their time-saving feature in tracking goods, which happens by scanning goods in less than a second. Additionally, the company has the option to modify these barcodes so that only they can use them. There are two varieties of barcoding: linear and matrix.

Linear barcode is the most used type of barcode, which is in the form of vertical lines arranged in a certain order with digits, as shown in figure (3), for manual input, and the most common data that it holds includes SKU number, name, weight, manufacturing and expiry date and manufacturer name. However, compared to a linear barcode, matrix barcodes and improved two-dimensional barcode types can store more information, such as ULR, SKU number, name, weight, text data, etc. (Kholodenko, 2022).

Bar code system

Data Matrix Code

Q R Code

Figure 1: Linear and Matrix Barcode

5. Conclusion

In conclusion, it can be stated that inventory is significant for businesses since it is essential to their expansion. In order to maximize its efficacy, inventory must be managed effectively once its significance has been established. Financial considerations, market demand, inventory theft, lead time, quality and quantity forecast, product types, vendors, and manufacturers are some of the variables that impact inventory efficiency.

As far as the inventory management techniques are concerned, no matter the size of the business, employing some of these common inventory management techniques can help to take control of the stock like Just in time (JIT) inventory, ABC inventory analysis, drop shipping, Bulk shipments, Consignments, cross–docking and cycle counting. Inventory is necessary for manufacturing businesses to run and fulfil orders from clients.

Making an accurate inventory assessment means the difference between a profit and a loss. Thus, the five key approaches to inventory management have been emphasized in this study. These approaches can enhance business performance because they can aid in future planning, may result in better customer service and higher satisfaction, allow organizations to take charge of their expenses, and help track sales and measure success. Lastly, it contributes to the manufacturer's increased productivity. Thus, in the end, it can be said that "Inventories can be managed, but people must be led

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