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# An Analysis on Inventory Management at Manufacturing Industry

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**ABSTRACT:** Every organization needs inventory for smooth running of its activities. It serves as a link between production and distribution processes. The investment in inventories constitutes the most significant part of current assets/working capital in most of the undertakings. Thus, it is very essential to have proper control and management of inventories. The purpose of inventory management is to ensure availability of materials in sufficient quantity as and when required and also to minimize investment in inventories. Raw materials, goods in process and finished goods all represent various forms of inventory. Each type represents money tied up until the inventory leaves the company as purchased products. Because of the large size of the inventories maintained by firms, a considerable amount of funds is required to be committed to them. It is therefore absolutely imperative to manage inventories efficiently and effectively in order to avoid unnecessary investments. A firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately. The reduction in excessive inventories carries a favourable impact on the company's profitability. The study starts with an introduction to inventory management, Company's profile, its Vision & Mission, Achievements and also the need for study, review of literature and objectives are set out for the study.

**KEYWORDS:** Inventory Management, Manufacturing Industry, Importance of Inventory.

## I. INTRODUCTION

Inventory control is vitally important to almost every type of business, whether product or service oriented. Inventory control touches almost every facets of operations. A proper balance must be struck to maintain proper inventory with the minimum financial impact on the customer. Inventory control is the activities that maintain stock keeping items at desired levels. In manufacturing since the focus is on physical product, inventory control focus on material control. "Inventory" means physical stock of goods, which is kept in hands for smooth and efficient running of future affairs of an organization at the minimum cost of funds blocked in inventories. The fundamental reason for carrying inventory is that it is physically impossible and economically impractical for each stock item to arrive exactly where it is needed, exactly when it is needed. Inventory management is the integrated functioning of an organization dealing with supply of materials and allied activities in order to achieve the maximum co-ordination and optimum expenditure on materials. Inventory control is the most important function of inventory management and it forms the nerve centre in any inventory management organization. An Inventory Management System is an essential element in an organization. It is comprised of a series of processes, which provide an assessment of the organization's inventory.

A company's inventory is one of its most valuable assets. In retail, manufacturing, food service and other inventory-intensive sectors, a company's inputs and finished products are the core of its business, and a shortage of inventory when and where it's needed can be extremely detrimental. At the same time, inventory can be thought of as a liability (if not in an accounting sense). A large inventory carries the risk of spoilage, theft, damage, or shifts in demand. Inventory must be insured, and if it is not sold in time it may have to be disposed of at clearance prices – or simply destroyed.

For these reasons, inventory management is important for businesses of any size. Knowing when to restock certain items, what amounts to purchase or produce, what price to pay – as well as when to sell and at what price – can easily become complex decisions. Small businesses will often keep track of stock manually and determine reorder points and quantities using Excel formulas. Larger businesses will use specialized enterprise resource planning (ERP) software. The largest corporations use highly customized software as a service (SaaS) applications.

Appropriate inventory management strategies vary depending on the industry. An oil depot is able to store large amounts of inventory for extended periods of time, allowing it to wait for demand to pick up. While storing oil is



expensive and risky – a fire in the UK in 2005 led to millions of pounds in damage and fines – there is no risk that the inventory will spoil or go out of style. For businesses dealing in perishable goods or products for which demand is extremely time-sensitive – 2019 calendars or fast-fashion items, for example – sitting on inventory is not an option, and misjudging the timing or quantities of orders can be costly. For companies with complex supply chains and manufacturing processes, balancing the risks of inventory gluts and shortages is especially difficult. To achieve these balances, firms have developed two major methods for inventory management: just-in-time and materials requirement planning.

## II. IMPORTANCE AND BENEFITS OF THE STUDY

### 1) Increased Sales

Businesses who actively manage their inventory report a 2-10% increase in sales.

### 2) Increased Information Transparency

Know when items are received, picked, packed, shipped, kitted, manufactured, etc. Also, know when you need to order more, when you're over-stocked, or under-stocked.

### 3) Shorter Lead Times

Businesses who actively manage their inventory report a 50% reduction in lead times.

### 4) Lower Costs

Effective inventory management practices help result in decreased inventory write-offs, plus lower inventory holding costs. Carrying extra inventory can be very costly for your firm.

### 5) Improved Delivery Performance

Real-time inventory updates improve the flow of goods to customers.

### 6) Increased Employee Efficiency

Good inventory management solutions save time. Less time spent on managing inventory results in greater productivity for you and your clients.

### 7) Accurate Planning

Stay steps ahead of the game and always have the right amount of products on hand by making decisions based on inventory trends.

### 8) Decreased Stock-Outs

Businesses who actively manage their inventory report a 10-25% decrease in stock-outs.

### 9) Increased Customer Loyalty

Improve your accuracy and efficiency, and your customers will love you for it. They'll trust you to fulfill their needs, and you'll have exactly what they're looking for when they come back for more.



#### 10) Increased Inventory Turnover

Optimize the value of goods you have and increase inventory turnover by keeping fewer slow-moving products on hand, while increasing your stock levels on profitable goods.

### III. PROBLEM STATEMENT

The problem statement of our project is **in existing approach** As above stated management problem the study was carried to know how inventory management helps in proper maintenance of working capital, so the title of this study is “inventory management and its effect on working capital”

### IV. RESEARCH OBJECTIVES

#### PRIMARY OBJECTIVE

- To analyse the efficiency of Inventory Management of Whirlpool of India Ltd.

#### SECONDARY OBJECTIVE

- To identify optimum level of inventory which minimizes the cost?
- To identify the safety stock level for various components.
- To classify the various components based on its value and movements.
- To identify inventory requirement of the company for the next year.

### V. LITERATURE REVIEW

Inventory management is considered as major concerns of every organization. In inventory holding, many steps are taken by managers that result a cost involved in this row. This cost may not be constant in nature during time horizon in which perishable stock is held. To investigate on such a case.

Taygi (2014) proposes an optimization of inventory model where items deteriorate in stock conditions. In this paper, based on a real-world case study for a municipal district in Tehran, a multi objective mathematical model is developed for the location-distribution problem. The proposed model considers the role of demand in an urban area, which might be affected by neighbor wards. Integrating decision making process for a disaster helps to improve a better relief operation during response phase of disaster management cycle. In the proposed approach.

Esmaili (2014) says, a proactive damage estimation method is used to estimate demands for the district based on worst-case scenario of earthquake in Tehran this paper deals with the application of six most potential preference ranking methods for selecting the best FMS for a given manufacturing organization.

Chatterjee and Chakraborty (2014) say, it is observed that although the performances of these six methods are almost similar, ORESTE method slightly outperforms the others. It is particularly applicable to those situations where the decision maker is unable to provide crisp evaluation data and attribute weight. Ulrich and Pearson (1998) introduce approaches for the integration of the Quality Function Deployment method as well as feedback with system components for computer aided product development. The integration is based on information models representing product, process and factory information.

Pastore and Martin (2012) study was to examine students' perceptions of designing and developing mobile based instructions by interviewing and surveying of graduate students. Results of the survey and qualitative data analysis indicated that usability was a key issue on the mobile device. Users enjoyed quick access, good organization, user control, single column layouts, and large links/buttons. These findings contribute to the literature base on the design and development of mobile based instruction.

Norman E (2012) discusses, while existing factors identified in the literature were found to be present in the context of today's design program, the critical perspective of this study decontextualized these factors, along with the identification of new or underrepresented factors. Taking on the perspective of a student's experience of pedagogy foregrounds issues of uncertainty and ambiguity, highlighting the social interactions between fellow students, and the role of communication and individual effort in learning to think in a more designedly way.





A design literature discusses the role of the studio and its related pedagogy in the development of design thinking. Scholars in a variety of design disciplines pose a number of factors that potentially affect this development process, but a full understanding of these factors as experienced from a critical pedagogy or student perspective is lacking.

In this study, Gray (2013) explains the experiences of six first-year design students were examined as they evolved in their conceptions of design.

Agnelo and Fernandes(2012) aims to analyze, through a case study called Researching the Value of Project Management, the relations of the constructs of this conceptual model and to show how they interfere with the organizational values, possibly in programs conducted by a government agency, from the perspective of the senior management directly involved. The term emerging technology (ET) has been frequently used by IT professionals and academics. However, little research has shed light on this term and specified its characteristics and what it means.

Halaweh M (2013) aims to define and conceptualize the characteristics of ET. These characteristics are uncertainty, network effect, unseen social and ethical concerns, cost, limitation to particular countries, and a lack of investigation and research. Today's industry projects and extensive literature suggest the importance of customer integration for companies' innovation success. In this exploratory study,

Strub and et al (2013), build on established customer role concepts to study the status quo of customer integration in industry, as well as reservations against the roles and negative experiences from customer integration projects. The study reveals a gap between reservations and actual negative experiences in losing know-how, as well as a positive effect of experience in customer integration on perceived benefits for the company.

Antonelli and et al (2013) aims to identify Information Technology benefits in individual work. With technologies fully implemented, greater satisfaction was observed for all constructs of the survey, with statistically significant differences. When comparing age, it was found that younger users were more satisfied with the benefits of technology. Concerning the number of employees, small business users were less satisfied with Information Technology.

Alderete (2013) presents an econometric model to determine whether an SME (Small and Medium Sized Enterprise)'s probability of outsourcing depends on their levels of innovation and information and communication technology use. The model predicts that the level of innovation of an SME will significantly influence its probability of outsourcing. Besides, it stresses the negative incidence of the information and communication technologies (ICT) access on the outsourcing decision.

Didonet and Díaz, (2012) explains, the supply chain management studies have verified that integration and collaboration in the supply chain can provide important benefits to the companies involved. Among these benefits are added value, the creation of efficiencies and client, which are represented by the reduction in inventories, improvements in service delivery and quality and shorter product development cycles.

Zabala (2012) investigates whether decisions considered as common in new product development literature are also valid in a region characterized by traditional industries. The author aims to link the theoretical and empirical fields in the context of new product development and product innovation management.

Leber (2014) reports the results of a survey on the use of innovation management techniques with the potential to improve effectiveness of new product development, and customer satisfaction. Failure mode and effects analysis was found as the most applied IMT in Slovene firms with the highest perceived utility potential to reduce development costs and improve customer satisfaction.

Nezhad (2013) employed the decision on belief (DOB) approach for fault detection in univariate process control. The concept of DOB and its application in decision making problems were introduced, and then methodology of modeling fault detection in statistical process control by DOB approach was discussed.

## **VI. RESEARCH DESIGN**

It is the framework for conducting the research. Type of design, research methods sample design, sources and type of data to be collected, data processing and analysis, measurement. You need to demonstrate your knowledge of alternative methods and make the case that your approach is the most appropriate and most valid way to address your research question.



## SECONDARY SOURCES

1. The data are collected from the annual reports maintained by the company for the past six years viz., 2002-2007
2. Data are collected from the company's website.
3. Books and journals pertaining to the topic.

## TOOLS USED IN THE ANALYSIS

- Economic Order Quantity.
- Safety Stock.
- ABC Analysis.
- FSN Analysis.
- Linear Regression method.

## VII. DATA ANALYSIS

### 1. ECONOMIC ORDER QUANTITY (EOQ)

#### Meaning

Economic Order Quantity is the Inventory management technique for determining optimum order quantity which is the one that minimizes the total of its order and carrying costs.

#### ANALYSIS & INTERPRETATION:

In the above table the EOQ & the no. of orders purchased per year for various components are calculated. The calculated EOQ is compared with the no. of units of each component purchased in the organization. It is found that, there is a variation in the EOQ & no. of unit purchased. It is understood that the company is not following EOQ for purchasing the materials & therefore the inventory management is not satisfactory.

### 2. SAFETY STOCK

#### Meaning

Safety stocks are the minimum additional inventory which serves as a safety margin to meet an unanticipated increase in usage resulting from an unusually high demand and an uncontrollable late receipt of incoming inventory.

#### ANALYSIS & INTERPRETATION:

In the above table, safety stock for the various components calculated is shown. Actual demand is given for each component for a period of 1 year and the lead-time is calculated at a maximum of 100 days & normal of 60 days and these were converted into per annum. So, from calculation of safety stock, we can able to determine how much the company can hold the inventory in reserve stock per annum.

### 3. ABC ANALYSIS

#### Meaning

The ABC system is a widely used classification technique to identify various items of inventory for purposes of inventory control. On the basis of unit cost involved, the various items are classified into 3 categories:

- (1) A, consisting of items with the large investment,
- (2) C, with relatively small investments but fairly large number of items and
- (3) B, which stands mid-way between category A & C.

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