

A STUDY ON INVENTORY MANAGEMENT AT BUTTERFLY GANDHIMATHI APPLIANCES, CHENNAI

Submitted in partial fulfillment of the requirements for the award of

Master of Business Administration

by

RATHIYA MARY V
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SCHOOL OF BUSINESS ADMINISTRATION

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by AICTE
Jeppiaar Nagar, RAJIV GANDHI SALAI, CHENNAI - 600 119**

April-2021



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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **RATHIYA MARY V (39410172)** who carried out the project entitled "**A Study on Inventory Management At Butterfly Gandhimathi Appliances, Chennai**" under my supervision from **January 2021 to March 2021**.

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Submitted for Viva voce Examination held on _____

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BUTTERFLY GANDHIMATHI APPLIANCES LIMITED

March 29, 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. V. RATHIYA MARY (Reg. No 39410172)** final year M B A Student of M/s. SATHYABAMA, INSTITUTE OF SCIENCE & TECHNOLOGY, RAJIV GANDHI SALAI, CHENNAI – 600 119. Has done project in the field of “**A STUDY ON INVENTORY MANAGEMENT,**” at our Organization during the period from 09.12.2020 to 29.03.2021.

During the project work period her conduct and character was good.

For BUTTERFLY GANDHIMATHI APPLIANCES LIMITED,

A handwritten signature in black ink, appearing to be 'N. Sukumar', written over a horizontal line.

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DECLARATION

I, **RATHIYA MARY V 39410172** hereby declare that the Project Report entitled **A Study on Inventory Management at Butterfly Gandhimathi Appliances, Chennai** done by me under the guidance of **MS. KAVITHA RAJAYOGAN** at SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY, CHENNAI and **Mr.N.SUKUMAR** at BUTTERFLY GANDHIMATHI APPLIANCES, CHENNAI is submitted in partial fulfillment of the requirements for the award of Master of Business Administration degree.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

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RATHIYA MARY V

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ABSTRACT

Inventory Management must be designed to meet the dictates of market place and support the company's Strategic Plan. The many changes in the market demand, new opportunities due to worldwide marketing, global sourcing of materials and new manufacturing technology means many companies need to change their Inventory Management approach and change the process for Inventory Control .This prominent system provides information to efficiently manage the flow of materials, effectively utilize people and equipment, coordinate internal activities and communicate with customers. Inventory Management does not make decisions or manage operations; they provide the information to managers who make more accurate and timely decisions to manage their operations. The main objective of this project is to study and understand the inventory management followed at Butterfly Gandhimathi Appliances. The analysis that describes the existing inventory management system in Butterfly Gandhimathi Appliances. The company financial status will help us to identify the performance undergoing in the manufacturing sector. Further this study will help you to understand the nature of the industry and the type of work carried out in recording the various aspects of inventory control in the management. Research methodology is a scientific and systematic way to solve the research problem. It is understood as a science of studying how research is done scientifically. It is necessary for the researcher to know not only the research methods and techniques but also methodology.

Keywords: Butterfly Gandhimathi appliances, inventory, analysis

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1. INTRODUCTION

1.1 INTRODUCTION

Inventory management and supply chain management are the backbone of any business operations. With the development of technology and availability of process driven software applications, inventory management has undergone revolutionary changes. In any business or organization, all functions are interlinked and connected to each other and are often overlapping. Some key aspects like supply chain management, logistics and inventory form the backbone of the business delivery function. Therefore these functions are extremely important to marketing managers as well as finance controllers. Inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet. Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid over or under inventory that can impact the financial figures. Inventory is always dynamic. Inventory management requires constant and careful evaluation of external and internal factors and control through planning and review. Most of the organizations have a separate department or job function called inventory planners who continuously monitor, control and review inventory and interface with production, procurement and finance departments.

A term inventory refers to the stock file of the products a firm is offering for sale and the components that make up the product. In other words, inventory is composed of assets that will be showed in future in the normal course of the business operations. The assets which firms store as inventory in anticipation of need are:

- i. Raw materials**
- ii. Work in process (Semi Finished goods)**
- iii. Finished goods**

The raw material inventory contains item that are purchased by the firm from other and are converted into finished goods through the manufacturing (production) process. They are an important input of the final product. The working process inventory consists of items currently being used in the

production process. They are normally semi finished goods that are at various stages of production in a multi stage production process. A finished goods represented final or completed products which are available for sale .The inventory of such goods consists of items that have been produced but are yet be sold. Inventory, as a current asset, differs from other current assets because only financial managers are not involved. Rather all the functional areas, finance, marketing, production, and purchasing are involved. The views concerning the appropriate level of inventory would differ among the different functional areas.

1.1.1 THE FUNCTIONS OF INVENTORY

Some functions of the firm, such as the purchase of raw materials, processing, and having finished goods available for sale, have a sequential, physical dependency. Maintenance of inventories allows the firm to decouple these functions so that each can be planned, scheduled, and operated independently. For retail firms, inventory provides customers with selection choices and decouples the purchasing function from the selling function.

1.1.2 TYPES OF INVENTORIES

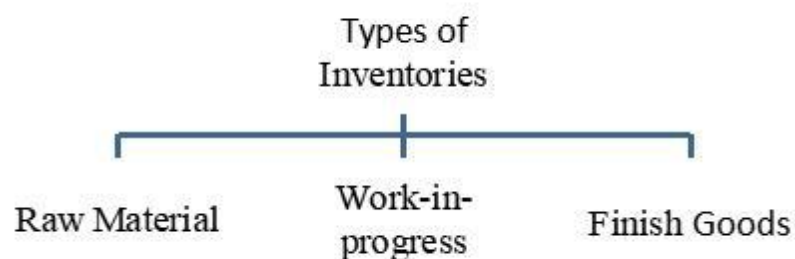


Figure 1.1.1 Figure representing types of inventories

1.1.2.1 RAW MATERIALS

These represent inputs purchased and stored to be converted into finished product in future by making certain manufacturing process on the same .A raw material or feedstock is the basic material from which a product is manufactured or made, frequently used with an extended meaning. For example, the term is used to denote material that came from nature and is in an unprocessed or minimally processed state. Latex, iron ore, logs, and crude oil, would be examples. The use of raw material by non-human species includes twigs and found objects as used by birds to make nests.

1.1.2.2 WORKS-IN-PROGRESS INVENTORY

These represents semi-manufactured products which need further processing before they can be treated as finished products. Just (acronym: JIT) production is a concept to reduce work in process with respect to a continuous configuration of product. Just In Sequence (acronym: JIS) is a similar concept with respect to a scheduled variety in sequence of configurations for products. That part of a manufacturer's inventory that is in the production process and has not yet been completed and transferred to the finished goods inventory. This account contains the cost of the direct material, direct labor, and factory overhead placed into the products on the factory floor. A manufacturer must disclose in its financial statements the cost of its work-in-process as well as the cost of finished goods and materials on hand. Work in process (WIP) or in-process includes the set at large of unfinished items for products in a production process. These items are not yet completed but either just being fabricated or waiting in a queue for further processing or in a buffer storage. The term is used in production and supply chain management.

1.1.2.3 FINISHED GOODS

These represents the finished products ready for sale in the market .Finished goods are goods that have completed the manufacturing process but have not yet been sold or distributed to the end user. When the good is completed as

to manufacturing but not yet sold or distributed to the end-user, it is called a "finished good".

1.1.3 NEEDS OF INVENTORY MANAGEMENT

1.1.3.1 TRANSACTION MOTIVE

The Company may require holding the inventories in order to facilitate the smooth and uninterrupted production and sales operations. It may not be possible for the smooth and uninterrupted production and sale operation because of some sudden break downs or interruptions. It may not facilitate the company to procure raw material whenever necessary. There may not be a time lag between the demand for the material and supply. Hence it is needed to hold the raw material inventory. Similarly, it may not be possible to produce the goods immediately after they are demanded by the customers. The need to hold work in progress arises due to production cycle.

1.1.3.2 PRECAUTIONARY MOTIVE

In addition to hold the inventories for routine transactions, the company may like to hold them against the risk of unpredictable changes in demand and supply forces.

Eg. The supply, of raw material may get delayed due to the factors like strike, transport disruption, short supply, lengthy processes involved in import of the raw material etc. Hence, the company should maintain sufficient level of inventories to take care of such situations. Similarly, the demand for finished goods may suddenly increase and if the company is unable to supply them, it may mean gain of the competitors. Hence company will like to maintain sufficient stock of finished goods.

1.1.3.3 SPECULATIVE MOTIVE

The company may like to purchase and stock the inventory in the quantity which is more than needed for production and sales purposes. This may be with the intention to get the advantages in terms of quantity discounted with bulk purchasing or anticipated price rise.

1.1.4 COST ASSOCIATED WITH INVENTORY

1.1.4.1 ORDERING COSTS

Ordering costs include payroll taxes, benefits and the wages of the procurement department, labor costs etc. These costs are typically included in an overhead cost pool and allocated to the number of units produced in each period.

- Transportation costs
- Cost of finding suppliers and expediting orders
- Receiving costs
- Clerical costs of preparing purchase orders
- Cost of electronic data interchange

1.1.4.2 INVENTORY HOLDING COSTS

This is simply the amount of rent a business pays for the storage area where they hold the inventory. This can be either the direct rent the company pays for all the warehouses put together or a percentage of the total rent of the office area utilized for storing inventory.

- Inventory services costs
- Inventory risk costs
- Opportunity cost - money invested in inventory
- Storage space costs
- Inventory financing costs

1.1.4.3 SHORTAGE COSTS

A shortage cost, also known as stock-out costs, occurs when businesses become out of stock for various reasons. Some of the reasons might be as below

- Emergency shipments costs
- Disrupted production costs
- Customer loyalty and reputation

1.1.4.4 SPOILAGE COSTS

Perishable inventory stock can rot or spoil if not sold in time, so controlling inventory to prevent spoilage is essential. Products that expire are a concern for many industries. Industries such as the food and beverage, pharmaceutical, healthcare and cosmetic industries, are affected by the expiration and use-by dates of their products.

1.1.4.5. INVENTORY CARRYING COSTS

This is the lesser-known aspect of inventory cost. This cost requires a certain amount of calculation to understand the extent of its impact on your P&L statement. Inventory carrying costs refers to the amount of interest a business loses out on the unsold stock value lying in the warehouses.

1.1.5 INVENTORY CONTROL – TERMINOLOGY

- ***Demand***

It is the number of items required per unit of time. The demand may be either deterministic or probabilistic in nature.

- ***Order cycle***

The time period between two successive orders is called order cycle.

- ***Lead time***

The length of time between placing an order and receipts of items is called lead time.

- ***Safety stock***

It is also called buffer stock or minimum stock. It is the stock or inventory needed to account for delays in materials supply and to account for sudden increase in demand due to rush orders.

1.2 COMPANY PROFILE



**Figure 1.2.1 Figure showing logo of BUTTERFLY GANDHIMATHI
APPLIANCES**

The era was the 1950's. Brass was still the wonder metal. The late Shri. V. Murugesu Chettiar envisioned Stainless Steel to become the next wonder. Thus was born a brand called 'Butterfly'.

The first product was the modest stainless steel tumbler. The Butterfly touch of perfection & quality even in the simple tumbler made it stand out. The reception we had for it made us expand our product line into various other utensils. It was not long before we mixed this perfection & our technical knowhow to create India's first stainless steel pressure cooker.

Today by building exquisite kitchen appliances ranging from LPG stoves, Mixer Grinders, Table Top Wet grinders to Blenders & Sandwich makers with cutting edge technology, we have planted ourselves as a pioneer & market leader in Kitchen appliances. With many firsts like, the first in India to introduce stainless steel pressure cookers, LPG stoves & Vacuum Flasks, they have also ensured that we will never leave you shorthanded in the kitchen.

This endeavor has not stopped at just winning the hearts of the lakhs of Butterfly consumers. Indian Standards Organization (ISI) raised the benchmark thermal efficiency of LPG stoves from 64% to 68% after we successfully demonstrated that they can provide that level of quality. They were also the first kitchen appliances brand in India to receive the ISO-9001 for manufacture & supply of LPG Stoves, mixer grinders & Table-top wet grinders.

1.2.1 AWARDS AND RECOGNITION

(i) Gangadharam Appliances Limited, (since merged with BGMAL), received the Quality Award First Prize from the Hon'ble Chief Minister of Tamil Nadu on 26.03.1993 in recognition of the Company achieving excellence in quality of production for Medium Industries sector way back during the year 1991-92.

(ii) BGMAL has won National Award – 2010, First Prize, awarded by Government of India, Ministry of Micro, Small and Medium Enterprises for its LPG Operated Stoves/Appliances.

(iii) In appreciation of BGMAL's performance and growth during the financial year 2011-12, M/s. Indian Oil Corporation Limited (IOCL) presented a memento for having stood first on All India basis in turnover, with respect to LPG Stoves supplied through the LPG Gas Distributors of IOCL.

(iv) At the Non-Fuel Channel Partners' Meet of IOCL held at Dharampur (Kasauli), Himachal Pradesh on 04.05.2013, BGMAL was awarded a Certificate of Excellence for achieving on all India basis the highest sales of LPG Stoves co-branded with Indane during the financial year 2012-13.

(v) BGMAL was the recipient of National Award 2012 – Second Prize, awarded by Ministry of Micro, Small and Medium Enterprises for Outstanding Entrepreneurship in Medium Enterprises.

(vi) BGMAL received Top Tax Payer – Central Excise, for the financial year 2013-14, in Chennai-III division of Central Excise.

1.2.2 PRODUCTS OFFERED



LPG Stove



Mixer Grinder



Table Top
Wet Grinder



Electric Chimney



Induction Cooktop



Electric Rice Cooker



Pressure Cooker



Non Stick Cookware



Juicer Mixer Grinder



Electric Kettle



Sandwich Maker



Air Cooler

Other Pioneering Products



Washer



Juicer



Hand Blender



Water Heater



Electric Iron



Pop-up Toaster

Figure 1.2.2 Figure representing products offered

1.2.3 KEY FOCUS AREAS

- Optimize investment on expansion of distribution network and brand building activities
- Continued focus on enhanced working capital position
- Maximizing cost efficiencies at all levels of operations

- To launch several innovative and ergonomic kitchen and domestic electrical appliances – world class products with immaculate design and added utility features developed through in-house R&D
- To further improve perception of product quality synonymous with the “BUTTERFLY” brand.
- Inventory de-stocking efforts undertaken by the Company are nearly complete and is expected to further boost efficiency and cash flow, while also improving the health of the balance sheet
- Long-term growth in primary sales to accrue from the various strategic initiatives undertaken by the Company.

1.3 NEED FOR THE STUDY

The company financial status will help us to identify the performance undergoing in the manufacturing sector. Further this study will help you to understand the nature of the industry and the type of work carried out in recording the various aspects of inventory control in the management. Hence it is undertaken to study the measures and controls of inventory management and inventory control system in organization. The information gathered would help the organization in enriching their performance.

1.4 SCOPE OF THE STUDY

The scope of the project is mainly concentrated on the study of different techniques used for inventory management control. Every organization needs inventory for smooth running of its activities, it serves as a link between production and distribution process. The investment in inventories constitutes the most significant part of current assets/working capital in most of the undertaking.

- This study aims at analyzing with help of tools of the financial performance of the company that are:
 - Trend Analysis
 - ABC Analysis

- Economic Order Quantity
 - Stock analysis
- Ratio analysis is the process of computing, determining and presenting the relationship of the items. A financial ratio expresses the relationship between two accounting figures.
 - Comparative financial statements are those statements, which have been designed in a way so as to provide time perspective to consider various elements of financial position embodied in such statements.

1.5 OBJECTIVES OF THE STUDY

1.5.1 PRIMARY OBJECTIVE

To know about the inventory management, strengths and weaknesses of Butterfly Gandhimathi Appliances through the inventory analysis techniques.

1.5.2 SECONDARY OBJECTIVE

- To study about the ordering levels for the important components of inventory.
- To understand and measure economic order quantity for the selected raw material items.
- To analyze its inventory management methods with the help of ABC analysis and Trend Analysis.

1.6 LIMITATIONS OF THE STUDY

- No primary data is used for study.
- The study has been limited i.e, (2016-2020).
- All ratios could not be covered under the study, because of inadequate information.

- Opinions of the managers of the organization were taken into consideration.
- The study provides an insight into the financial, personnel, marketing and aspects of BUTTERFLY GANDHIMATHI APPLIANCES.
- Every study will be bound with certain limitations.
- One of the factors of the study was lack of availability of ample information.
- Most of the information has been kept confidential.

2. REVIEW OF LITERATURE

2.1 REVIEW OF LITERATURE

A review of literature presents much more than a summary of relevant sources. The act of reviewing involves evaluating individual sources as well as synthesising these sources in order to gain a broad view of the field. At this 'field level', a literature review discusses common and emerging approaches, notable patterns and trends, areas of conflict and controversies, and gaps within the relevant literature.

Edwin Sitienei and Florence Memba (2015) Conducted a study on Effect of Inventory Management on profitability of Cement Manufacturing Companies in Kenya. The study concluded that Gross profit margin is negatively correlated with the inventory conversion period, Increase in sales, which denotes the firm size enriches the firm's inventory levels, which pushes profits upwards due to optimal inventory levels.

Srinivas Rao Kasisomayajula (2014) An analytical study was conducted on "Inventory Management in Commercial Vehicle Industry In India". A sample of five companies' was selected for study. The study concluded that all the units in the commercial vehicle industry have significant relationship between Inventory and Sales. Proper management of inventory is important to maintain and improve the health of an organization. Efficient management of inventories will improve the profitability of the organization.

KeahChoon Tan (2014) Over the past decade, the traditional purchasing and logistics functions have evolved into a broader strategic approach to materials and distribution management known as supply chain management. This research reviews the literature base and development of supply chain management from two separate paths that eventually merged into the modern era of a holistic and strategic approach to operations, materials and logistics management.

Panigrahi (2013) Undertook an in-depth study of inventory management practices followed by Indian cement companies and its affect on working capital efficiency. The study also investigated the relationship between profitability and inventory conversion days. The study, using a sample of the top five cement companies of India over a period of 10 years from 2001 to 2010, concluded that a considerable inverse linear relationship existed between inventory conversion period and profitability.

Madishetti and Kibona (2013) Found that a well designed and executed inventory management contributes positively to a small or medium-sized enterprises (SMEs) profitability. Tey studied the association between inventory conversion period and profitability and the impact of inventory management on SMEs profitability. They took a sample of 26 Tanzanian SMEs, and used the data from financial statements for the period 2006–2011. Regression analysis was adopted to determine the impact of inventory conversion period over gross operating profit. The results cleared out that significant negative linear relationship occurred between inventory conversion period and profitability.

Perter Fredriksson (2013) To identify operations and logistics insures which are critical for the operational performance in modular assembly processes. Based on case studies of Volvo Cars, Toyota, and Saab, the paper identifies operations and logistics issues that are critical for the operational performance of modular assembly processes.

Lambrix and Singhvi (2013) Adopted working capital cycle approach in working capital management, also suggested that investment in working capital can be optimized and cash flows can be improved by reducing the time frame of physical flow starting from the receipt of raw material to the shipment of finished goods

Lwiki et al (2013) A survey conducted on all the eight (8) sugar manufacturing firms in Kenya established that there is generally positive

correlation between each of inventory management practices. Specific performance indicators were proved to depend on the level of inventory management practices.

Juite Wang, Yun-Feng Shu (2014) Managing Supply Chain (SC) is very difficult, since various sources of uncertainty and complex interrelationships between various entities exist in the Supply Chain. Moreover, the reducing product life cycle and the heightened expectations of customers -have also made the Supply Chain even harder to manage especially for innovative products.

Ttaet al. (2013) presents a mixed integer linear programming model for international facility location decisions considering exchange and tariff rates. Along with location, production and distribution functions, investment level was also considered as one of the decision variables.

Lee H. L.(2013) said excellent supply chain possesses three attributes: agility, adaptability, and alignment. Firms need to build deep partnerships with each other, so they can share profit, cost, information, and risk in the supply chain

Richard F.Doner et al. (2013) Rationalization and stabilization following the Asian financial crisis of the late 1990s combined with the expansion and liberalization of regional and global trade to create significant parts industries in the republic of Korea, China and Indonesia.

Kee-hung Lai et al. (2012) This study aims to investigate the construct of, and develop a measurement instrument for, supply chain performance(SCP) in transport logistics. Based on the supply chain operations reference model and various established measures, a measurement mode and a measurement instrument for SCP in transport logistics are developed.

Sahari, Tinggi and Kadri (2012) Empirically analyzed the relationship between inventory management and firm performance along with capital

intensity. For the purpose they took a sample of 82 construction firms in Malaysia for the period 2006–2010. Using the regression and correlation analysis methods, they deduced that inventory management is positively correlated with firm performance. In addition, the results indicate that there is a positive link between inventory management and capital intensity.

Soni (2012) Made an in depth study of practices followed in regard to inventory management in the engineering goods industry in Punjab. The analysis used a sample of 11 companies for a period five years, that is, 2004–2009 and was done using panel data set. The adequate and timely flow of inventory determines the success of an industry. She concluded that size of inventory enhanced marginally over the period as compared to a hike in current assets and net working capital.

Nyabwanga and Ojera (2012) They Highlighted the association between inventory management practices and business performance of small-scale enterprises (SSEs), in Kisii Municipality, Kisii County, Kenya. They used a cross-sectional survey study based on a small sample size of 79 SSEs. The study inferred that inventory comprised the maximum portion of working capital, and improper management of working capital was one of the major reasons of SSE failures.

Eneje et al (2012) Investigated the effects of raw materials inventory management on the profitability of brewery firms in Nigeria using a cross sectional data from 1989 to 2008 which was gathered for the analysis from the annual reports of the sampled brewery firms. Measures of profitability were examined and related to proxies for raw materials inventory management by brewers.

Rich Lavelly (2012) Asserts that inventory means “Piles of Money” on the shelf and the profit for the firm. However, he notices that 30% of the inventory of most retail shops is dead. Therefore, he argues that the inventory control

is facilitate the shop operations by reducing rack time and thus increases profit.

Farzaneh (2012) Presented a mathematical model, to assist the companies in their decision to switch from EOQ to JIT purchasing policy. He defines JIT as “to produce and deliver finished goods just in time to be sold, sub-assemblies just in time to be assembled in goods and purchased material just in time to be transformed into fabricated parts”

Lal (2011) He studied Modi Steels Limited as a case study, his study focused on inventory management. He originated a model which involve price variable in inventory management; earlier price variable in inventory was not considered in that company

Dave and Patel (2011) studied an inventory system with finite planning horizon, multiple replenishments but equal order cycles, constant deterioration rate, no shortages and linearly changing demand rate. The objective is to find the optimal number of replenishments.

Krishna Murthy (2011) Study was aggregative and dealt with inventories in the private sector of Indian economy as a whole for the period 1948-61. This study used sales to represent demand for the product and suggested the importance of accelerator. Short- term rate of interest had also been found to be significant

Gaur, Fisher and Raman (2011) In their study examined firm-level inventory behavior among retailing companies. They took a sample of 311 public-listed retail firms for the years 1987–2000 to examine the relationship of inventory turnover with gross mar- gin, capital intensity.

Dave Piasecki (2011) He focused on inventory model for calculating the optimal order quantity that used the Economic Order Quantity method. He points out that many companies are not using EOQ model because of poor

results resulted from inaccurate data input. He says that EOQ is an accounting formula that determines the point at which the combination of order costs and inventory costs are the least. He highlights that EOQ method would not conflict with the JIT approach

Gaur and Bhattacharya (2011) Attempted to study the linkage between the performance of the components of inventory such as raw material, work in progress and finished goods and financial performance of Indian manufacturing firms. The study revealed that finished goods inventory as inversely associated with business performance while raw material inventory and work in progress did not have much effect on same. They emphasized that instead of focusing on total inventory, an attempt should be made to concentrate on individual components of inventory so as to adequately manage the same. They concluded that managers not paying heed to inventory .

Enagbonma O. and Eraikhuemen I.B(2011) This paper deals with the problem of computing optimal ordering policies for a single product with fixed lifetime of exactly m periods. We presents a proposed cost function for the inventory.

V. Paramasivam et al. (2010) Decision making in equipment selection: an integrated approach with digraph and matrix The equipment selection process is considered in the early stage of the design process since the equipment selection process decides the quality, cost, and reliability, which are important for customer satisfaction.

S. Singh (2010) Analyzed the inventory control practices of single fertilizer company named IFFCO. He statistically examined the inventory system with consumption, sales and other variables along with growth of these variables and inventory patterns. He concluded that an increase in components of inventory lead to an increase in the proportion of inventory in current assets.

Mishra (2010) It is the study of six major public sector enterprises. He concluded that (i) inventory constitutes the most important component of working capital of public enterprises (ii) efficiency of working capital funds employed in receivables is terribly low in the selected enterprises

R.S. Chadda (2010) Study had been made on inventory management practices of Indian companies. The analysis suggested application of modern scientific inventory control techniques like operations research. These modern scientific techniques furnish opportunities for the companies, Companies can minimize their investment in inventory but there is continuous flow of production.

Felix T. S. Chan and Hing Kai Chan (2010) In the fast- changing fashion market, being flexible and adaptive is a key to survival. Therefore, supply chain strategy like quick response is important in the fashion or textile industry Selection of suppliers to support such strategies is thus one of the most critical activities, but is not well studied.

Capkun, Hameri and Weiss (2009) Statistically analyzed the relationship between inventory performance and financial performance in manufacturing companies using the financial information of a large sample of US-based manufacturing firms over a 26-year period, that is, 1980 to 2005. They inferred that a significant relationship existed between inventory performance along with the performance of its components and profitability. Raw material inventory performance was highly correlated to gross profit and operating profit. Work in progress inventory was highly correlated to gross profit measures while finished goods inventory performance was more correlated with operating profit.

Zadeh (2009) It is an inference procedure that derives conclusions from a set of fuzzy if-then rules, and an effective approach to modeling human thinking. In this work, a fuzzy approach is used to reason from fuzzy numbers,

considering decision makers' subjective assessments, to obtain a_{ij} 's in the pair wise matrix of the AHP

Abramovitz and Modigliani (2009) They highlighted the relationship between capacity utilization and inventory investment. Existing stock of inventories was expected to adjust to the desired levels. Thus the variable, existing stock of inventories, was essential to be negatively related with the desired stock.

Liang-Tu Chen and Chun-Chin Wei (2009) The objective of the model is to jointly determine the optimal selling price, base-stock level, and inventory cycle over an infinite planning horizon so that the net profit per time unit in the channel is maximized. The profit-maximizing problem is formulated as a multivariate optimization model, solved by an iterative search process combined with an enumeration scheme.

Pradeep singh (2008) In his study made an attempt to examine the inventory and working capital management of Indian Farmers Fertilizer Co- operative Limited (IFFCO) and National Fertilizer Limited (NFL). He concluded that the overall position of the working capital of IFFCO and NFL is satisfactory. But there is a need for improvement in inventory in case of IFFCO. However inventory was not properly utilized and maintained by IFFCO during study period. The management of NFL must try to properly utilize the inventory and try to maintain the inventory as per the requirements. So that liquidity will not interrupt .

R.A.Aliev et al. (2007) Aggregate production-distribution planning (APDP) is one of the most important activities in supply chain management (SCM). When solving the problem of APDP, we are usually faced with uncertain market demands and capacities in production environment, imprecise process times, and other factors introducing inherent uncertainty to the solution.

3. RESEARCH METHODOLOGY

It is a scientific and systematic way to solve the research problem. It is understood as a science of studying how research is done scientifically. It is necessary for the researcher to know not only the research methods and techniques but also methodology. Research design is the conceptual structure within which the research is conducted. It constitutes the blueprint for collection, measurement and analysis. The study aims at narration of existing facts regarding finance of the company. The researcher has to use facts or information already available and analyze that fact to make critical evaluations of the inventory management. The data collection is based on secondary data for analysis are taken from the company Annual report & Stores files. Tools and techniques are used for analysis Ratio Analysis, ABC Analysis and Stock collection period.

3.1 RESEARCH DESIGN

A research design is the detailed blueprint used to guide a research study towards its objective. Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximum information with the minimum effort, time and money.

The research design used in this project is Analytical in nature the procedure using, which researcher has to use facts or information already available, and analyze these to make a critical evaluation of the performance.

The researcher used descriptive research design to describe the phenomenon as it exists. Therefore it is undertaken in order to ascertain and be able to describe the characteristics of the variable of interest in a situation. It will take the description of inventory management techniques.

3.2 SAMPLING TECHNIQUES

The sampling techniques used in this study are

- Trend Analysis
- ABC Analysis
- Economic Order Quantity
- Stock Levels

3.2.1 TREND ANALYSIS

Trend analysis involves the collection of information from multiple time periods and plotting the information on a horizontal line for further review. The intent of this analysis is to spot actionable patterns in the presented information. In business, trend analysis is typically used in two ways, which are as follows:

- **Revenue and cost analysis.**

Revenue and cost information from a company's income statement can be arranged on a trend line for multiple reporting periods and examined for trends and inconsistencies. For example, a sudden spike in expense in one period followed by a sharp decline in the next period can indicate that an expense was booked twice in the first month. Thus, trend analysis is quite useful for examining preliminary financial statements for inaccuracies, to see if adjustments should be made before the statements are released for general use.

- **Investment analysis.**

An investor can create a trend line of historical share prices and use this information to predict future changes in the price of a stock. The trend line can be associated with other information for which a cause-and-effect relationship may exist, to see if the causal relationship can be used as a predictor of future stock prices. Trend analysis can also be used for the entire stock market, to detect signs of an impending change from a bull to a bear market, or the reverse. The logic behind this analysis is that moving with a trend is more likely to generate

profits for an investor.

When used internally (the revenue and cost analysis function), trend analysis is one of the most useful management tools available. The following are examples of this type of usage:

- Examine revenue patterns to see if sales are declining for certain products, customers, or sales regions.
- Examine expense report claims for evidence of fraudulent claims.
- Examine expense line items to see if there are any unusual expenditure in a reporting period that require additional investigation.
- Extend revenue and expense line items into the future for budgeting purposes, to estimate future results.

When trend analysis is being used to predict the future, keep in mind that the factors formerly impacting a data point may no longer be doing so to the same extent. This means that an extrapolation of a historical time series will not necessarily yield a valid prediction of the future. Thus, a considerable amount of additional research should accompany trend analysis when using it to make predictions.

3.2.2 ABC ANALYSIS

ABC analysis is an approach for classifying inventory items based on the items' consumption values. Consumption value is the total value of an item consumed over a specified time period, for example a year. The approach is based on the Pareto principle to help manage what matters and is applied in this context:

- **A items** are goods where annual consumption value is the highest. Applying the Pareto principle (also referred to as the 80/20 rule where 80 percent of the output is determined by 20 percent of the input), they comprise a relatively small number of items but have a relatively high consumption value. So it's logical that analysis and control of this class

is relatively intense, since there is the greatest potential to reduce costs or losses.

- **B items** are interclass items. Their consumption values are lower than A items but higher than C items. A key point of having this interclass group is to watch items close to A item and C item classes that would alter their stock management policies if they drift closer to class A or class C. Stock management is itself a cost. So there needs to be a balance between controls to protect the asset class and the value at risk of loss, or the cost of analysis and the potential value returned by reducing class costs. So, the scope of this class and the inventory management policies are determined by the estimated cost-benefit of class cost reduction, and loss control systems and processes.
- **C items** have the lowest consumption value. This class has a relatively high proportion of the total number of lines but with relatively low consumption values. Logically, it's not usually cost-effective to deploy tight inventory controls, as the value at risk of significant loss is relatively low and the cost of analysis would typically yield relatively low returns.

A business may have different risk appetites between different locations. For example, a location in a high-crime area may have a higher proportion of A items or, where a facility is less secure, more items may be classed as A. The management accountant should carry out risk and stock management cost-benefit analyses by location to deliver the optimal overall cost-benefit balance and to set the ABC ranges.

Table 3.2.1 Table showing example of ABC analysis

Class	Items	Cumulative	Consumption value	Cumulative
A	20%	20%	70%	70%
B	30%	50%	>20%	90%
C	50%	100%	10%	100%

What benefits does the approach provide?

- Better control over high-value inventory improves availability, and reduces losses and costs.
- More efficient use of stock management resources. For example, during stock count more resources are dedicated to A class than B or C class holdings, or fewer counts are made of B or C class holdings – which saves time and money.
- Relatively low value of B or C class holdings can allow a business to hold bigger buffer stocks to reduce stock outs.
- Fewer stock outs resulting in improved production efficiency.
- Fewer stock outs and improved production efficiency resulting in more reliable cycle time and, therefore, improved customer satisfaction.

3.2.3 ECONOMIC ORDER QUANTITY

A decision about how much to order has great significance in inventory management. The quantity to be purchased should neither be small nor big because costs of buying and carrying materials are very high. Economic order quantity is the size of the lot to be purchased which is economically viable. This is the quantity of materials which can be purchased at minimum costs. Generally economic order quantity is the point at which inventory carrying

costs are equal to order costs. In determining economic order quantity it is assumed that cost of managing inventory is made up solely of two parts i.e., ordering cost and carrying cost. The cost relationships are shown in below figure.

FORMULA FOR CALCULATING ECONOMIC ORDER QUANTITY (EOQ)

$$EOQ = \sqrt{\frac{2 * \text{Demand} * \text{Re-order Cost}}{\text{Carrying Cost}}}$$

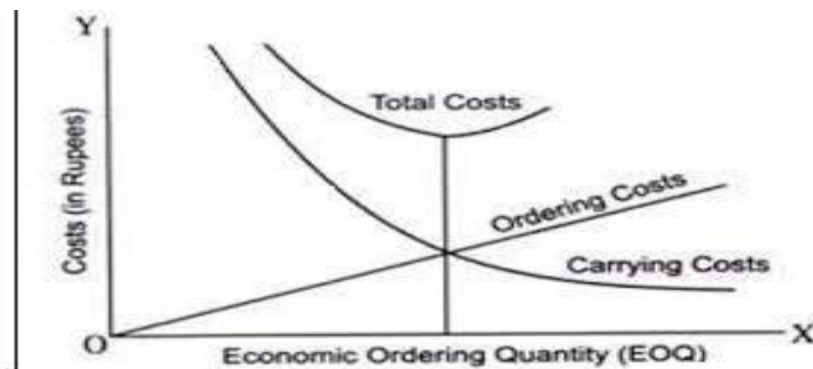


Fig: 3.2.3. Figure representing economic order quantity

3.2.4 STOCK LEVELS

Carrying of too much and too little of inventories is detrimental to the firm. If the inventory level is too little, the firm will face frequent stock-outs involving heavy ordering cost and if the inventory level is too high it will be unnecessary tie-up of capital. Therefore, an efficient inventory management requires that a firm should maintain an optimum level of inventory where inventory costs are the minimum and at the same time there is not stock-out which may result in loss of sale or stoppage of production. Various stock levels are discussed as such.

(a) Minimum Level:

This represents the quantity which must be maintained in hand at all times. If stocks are less than the minimum level then the work will stop due to shortage of materials. Following factors are taken into account while fixing minimum

stock level:

- **Lead Time:** A purchasing firm requires some time to process the order and time is also required by supplying firm to execute the order. The time taken in processing the order and then executing it is known as lead time.
- **Rate of Consumption:** It is the average consumption of materials in the factory. The rate of consumption will be decided on the basis past experiences and production plans.
- **Nature of Material:** The nature of material also affects the minimum level. If material is required only against special orders of customer then minimum stock will not be required for such materials.

Minimum stock level = Re-ordering level – (Normal consumption × Normal Reorder period)

(b) Re-ordering Level:

When the quantity of materials reaches at a certain figure then fresh order is sent to get materials again. The order is sent before the materials reach minimum stock level. Reordering level is fixed between minimum and maximum level. The rate of consumption, number of days required to replenish the stock and maximum quantity of material required on any day are taken into account while fixing reordering level.

Re-ordering Level = Maximum Consumption × Maximum Re-order period

(c) Maximum Level:

It is the quantity of materials beyond which a firm should not exceed its stocks. If the quantity exceeds maximum level limit then it will be overstocking. A firm should avoid overstocking because it will result in high material costs.

*Maximum Stock Level = Re-ordering Level + Re-ordering Quantity
– (Minimum Consumption × Minimum Re-ordering period)*

(d) Danger Level:

It is the level beyond which materials should not fall in any case. If danger level arises then immediate steps should be taken to replenish the stock even if more cost is incurred in arranging the materials. If materials are not

arranged immediately there is possibility of stoppage of work.

Danger Level = Average Consumption × Maximum reorder

(e) Average Stock Level:

The average stock level is calculated as such:

Average Stock level = Minimum Stock Level + $\frac{1}{2}$ of Re-order quantity

3.3 SOURCES OF DATA COLLECTION

The researcher used both primary and secondary sources

Primary sources

This refers to raw facts collected or generated for a given research and it is gathered originally for the first time for a specific research problem. Therefore the researcher will directly go to the field to collect data with the assistance of the letter of introduction from the school.

Secondary data

Secondary data is the data, which has been collected by someone else for some other purpose and is used by the researcher in his research for study. Various sources of secondary data are:-

- Books
- Journals / magazines
- Internet
- Records

In this project, secondary data collected is collected from the following sources.

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

4. DATA ANALYSIS AND INTERPRETATION

After the data is collected it has to analyze. The data is classified into purposeful and usable category. The analysis can be done by means of various statistical measures. For representation of the data use of Pie Chart is made. After data analysis is done, the obtained information is interpreted and various inferences are made and also conclusions are drawn related to the objectives, which have been listed, in the beginning of project.

- This study will follow the analytical type. In analytical research, the research has to use facts or information available, and analyze these to make critical evaluation of material like in this project.
- This project is based on both primary data. After collection of the primary and secondary data, some statistical tools are used: - Tables, Graphs and charts etc.

4.1 SOURCE DATA

Table 4.1.1 Table showing inventory information

TOTAL INVENTORY FOR EACH YEAR						
S. no	Name	2020 (in lakhs)	2019 (in lakhs)	2018 (in lakhs)	2017 (in lakhs)	2016 (in lakhs)
1	Raw Materials	4616.06	4370.63	5158.81	4509.93	4050.26
3	Spares	210.77	178.78	127.48	124.94	148.11
4	Stores	7.62	11.45	7.89	6.09	7.96
2	Stock in Process	1245.11	1267.79	768.26	1846.83	1591.92
5	Finished Goods	7042.11	4547.12	3078.01	2482.34	3801.24
	TOTAL	13121.67	10375.77	9140.45	8970.13	9599.49

Table 4.1.2 Table showing cost of parts

Product Name	Parts name	Rupees
<i>LPG Stove</i>		
1	BRASS BURNER REGULAR BIG – (180 GMS)	165.86
2	PAN SUPPORT REGULAR ENAMELED	128.79
3	BODY ASSEMBLY (FRIENDLY 3B, IOCL TB)	406.84
<i>Pressure Cooker</i>		
1	SS CIRCLE 444 DIA X 1.25MM THICKNESS	230.62
2	A 7.5LTR BOTTOM AFTER 2ND POLISH	341.46
3	BAKELITE POWDER - TG618/15 IP	7.4
<i>Table Top Wet Grinder</i>		
1	S.S SHEET (750X196)	89.03
2	ABS POWDER CHERRY RED	164.24
3	ROLLER STONE WITH BUSH	63.16
<i>Mixer Grinder</i>		
1	LEAD WIRE -GREY (.75 SQMM) "G"	53.13
2	ABS POWDER – LUCKY GREY	77.68
3	1.5 L JAR ASSEMBLY MATCHLESS(WHITE	193.77

4.2 TREND ANALYSIS

4.2.1 RATIO OF INVENTORY TO CURRENT ASSETS

Table 4.2.1 Table showing ratio of inventory to current assets

Trend Analysis of Inventory to Current Asset(in lakhs.)			
YEAR	INVENTORY	CURRENT ASSET	RATIO
2015-16	12382.2	40554.99	30.53%
2016-17	10879.94	24045.34	45.25%
2017-18	12513.37	29597.53	42.28%
2018-19	14210.29	28723.91	49.47%
2019-20	17011.36	31296.28	54.36%

INTERPRETATION

From this trend analysis, the ratio of inventory to current asset for the last five years of period is lies between 30% to 50%. And the amount of the inventory is around 100-150 lakhs always.

4.2.2 INVENTORY TURNOVER RATIO OF BUTTERFLY GANDHIMATHI APPLIANCES

Table 4.2.2 Table showing Inventory Turnover Ratio of Butterfly Gandhimathi Appliances

INVENTORY TURNOVER RATIO OF BGA (in lakhs.)				
Year	Sales	Inventory	Inventory Turnover Ratio	Storage Period
2015-16	53400.00	12382.2	4.31	62
2016-17	44734.60	10879.94	4.11	45
2017-18	54056.00	12513.37	4.32	60
2018-19	65198.00	14210.29	4.59	52
2019-20	67870.00	17011.36	3.99	49

INTERPRETATION

From this trend analysis, the inventory turnover ratio for the last five years of period is lies between 3.5-4 And the amount of the inventory is around 100-150 lakhs always with the average storage period of 50 days.

4.2.3 FINISHED GOODS TURNOVER RATIO OF BUTTERFLY GANDHIMATHI APPLIANCES

Table 4.2.3 Table showing Finished Goods Turnover Ratio of Butterfly Gandhimathi Appliances

Finished Goods Turnover Ratio Of BGA (in lakhs.)				
Year	Sales	Avg. Stock of FG	FG Turnover Ratio	Holding Period
2015-16	53400.00	2932.15	18.21	60
2016-17	44734.60	1989.39	22.49	66
2017-18	54056.00	3078.01	17.56	58
2018-19	65198.00	4547.12	14.34	51
2019-20	67870.00	5042.71	13.46	49

INTERPRETATION

From this trend analysis, the finished goods turnover ratio for the last five years of period is lies between 14-18 And the average stock of the finished goods is always above 2000 lakhs with the holding period of 55 days.

4.3 ABC ANALYSIS

In this analysis,

Category A

- 70% of items with 80% of total turnover
 - *LPG Stoves*
 - *Mixer Grinder*

Category B

- 20% of items with 15% of total turnover
 - *Table Top Wet Grinder*
 - *Pressure Cooker*

Category C

- 10% of items with 05% of total turnover
 - *Flask & Bottle*

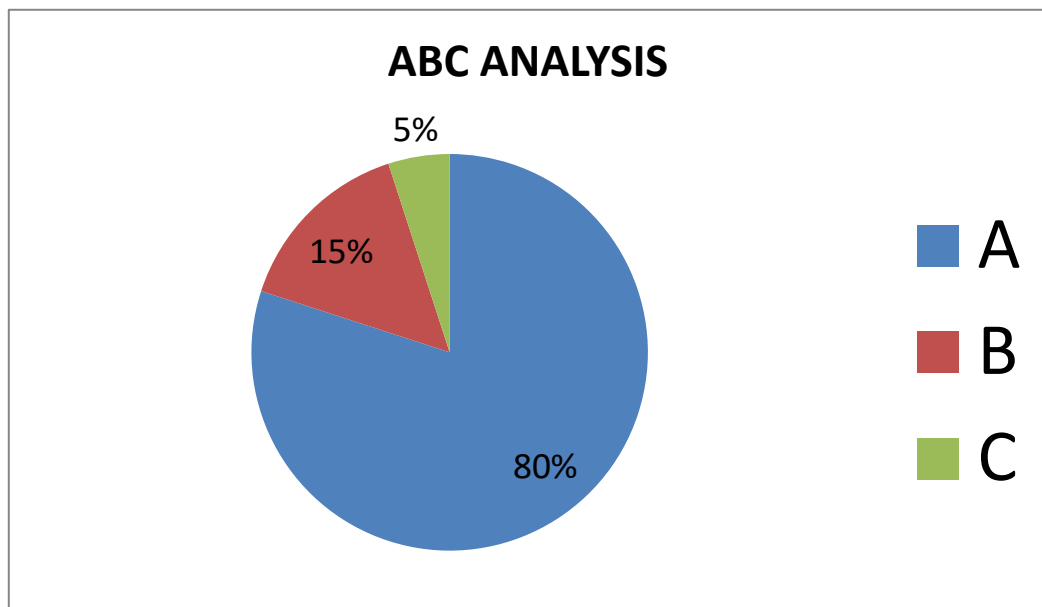
Table 4.3.1 Table showing Total turnover of each products

Total Turnover percentage of the products for each year						
Name of Product	2015-16	2016-17	2017-18	2018-19	2019-20	Average TOP
LPG Stoves	19.00%	35.81%	36.00%	33.18%	28.90%	31%
Mixer Grinder	14.00%	26.18%	23.08%	25.21%	28.92%	23%
Table Top Wet Grinder	49.00%	12.67%	11.77%	11.72%	11.61%	19%
Pressure Cooker	2.70%	11.41%	12.55%	12.93%	16.06%	11%
Flask & Bottle	0	4.60%	5.81%	5.37%	5.83%	4%

Table 4.3.2 Table showing ABC analysis

ABC ANALYSIS				
Category	Item Name	% of the item in inventory	Revenue of the item (in lakhs)	Revenue % of the item
A	LPG,MIXIE	70%	44578.4	80%
B	TTWG, COOKER	20%	9085.6	15%
C	F& B	10%	2630.4	5%

Chart 4.3.2. Chart representing ABC analysis



INTEPRETATION

From the above table 4.3.2 shows the classification of various components as A,B & C classes using ABC analysis techniques based on unit value.

Here, LPG & Mixie are taken as A category which gives more than 80% of revenue, Table Top Wet Grinder taken as B category which gives over 15% of revenue and Flasks and bottles are taken as C category which gives around 5% of revenue to the total revenue of the company.

4. 4 ECONOMIC ORDER QUANTITY (EOQ)

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.

Table 4.4.1 Table showing Economic order quantity (EOQ) of each product

Components	Demand Per year	Carrying Cost/order	Ordering Cost/unit/year	EOQ Unit Per order	No. of order per year
RHINO TURBO MG	2400	1010	150	68.93	34.81
DESIRE 1HP MG	6000	222	150	232.49	25.80
CYCLONE MG	6000	655	150	135.35	61
TORNADO MG	6000	1800	150	57.75	103.89
SPLENDID MG	6000	4000	150	54.77	109.66
PEBBLE MG	6000	1300	150	96	63
MATCHLESS MG	6000	700	150	130.93	45.82
JET 750W MG	6000	420	150	169	35.49
IVORY PLUS MG	6000	899	150	115.90	44.77
GRAND PLUS MG	6000	1500	150	89.44	67.08
REFLECTION 3B LPG	6000	1000	150	109.54	54.79
ACE DB LPG	6000	445	150	164.21	36.58
GRAND 2B LPG	1800	999	150	60.20	30
RADIANT 2B LPG	1800	885	150	24.64	73.05

GT PRISM 2B LPG	12000	2000	150	109.54	110
RHINO TTWG	12000	5000	150	69.28	173.91
MATCHLESS PLUS TTWG	12000	8000	150	54	222
SUPERB PLUS PC	12000	8,400	150	53	226
STANDARD PLUS PC	12000	5050	150	68.96	174
PEARL PLUS PC	12000	4000	150	77	155
ELEGANT PLUS PC	12000	7610	150	58.55	206
CURBE PC	12000	8400	150	138	86

Chart 4.4.1 Chart representing EOQ unit per order

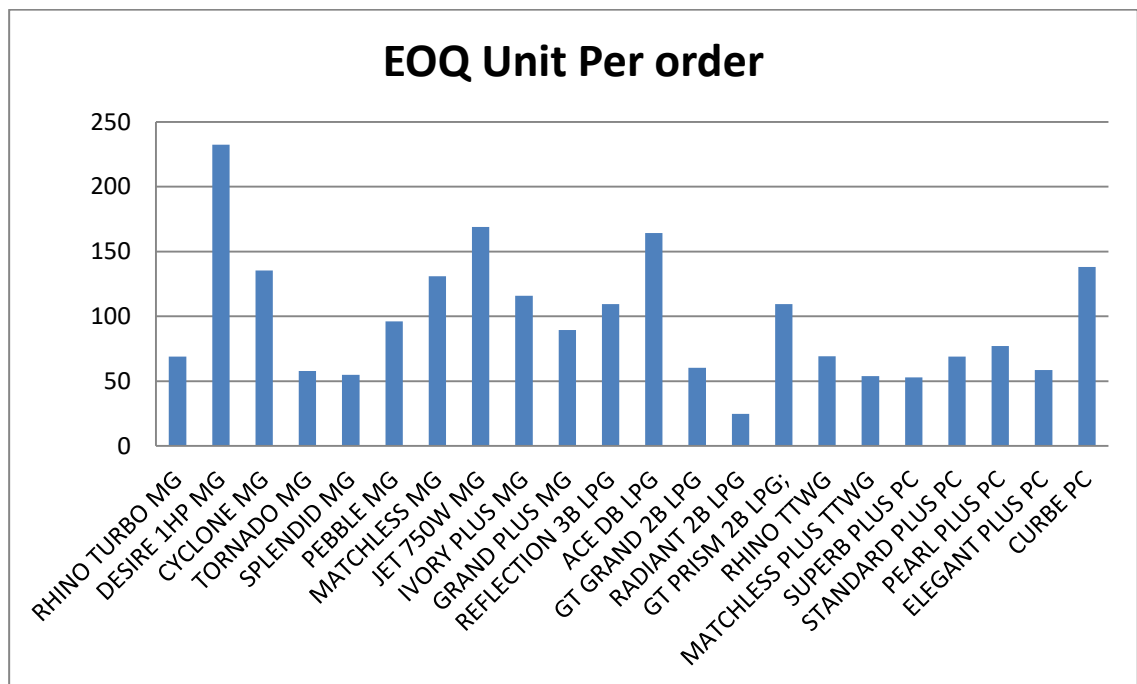


Chart 4.4.2 Chart representing EOQ, Demand, carrying cost, ordering cost -1

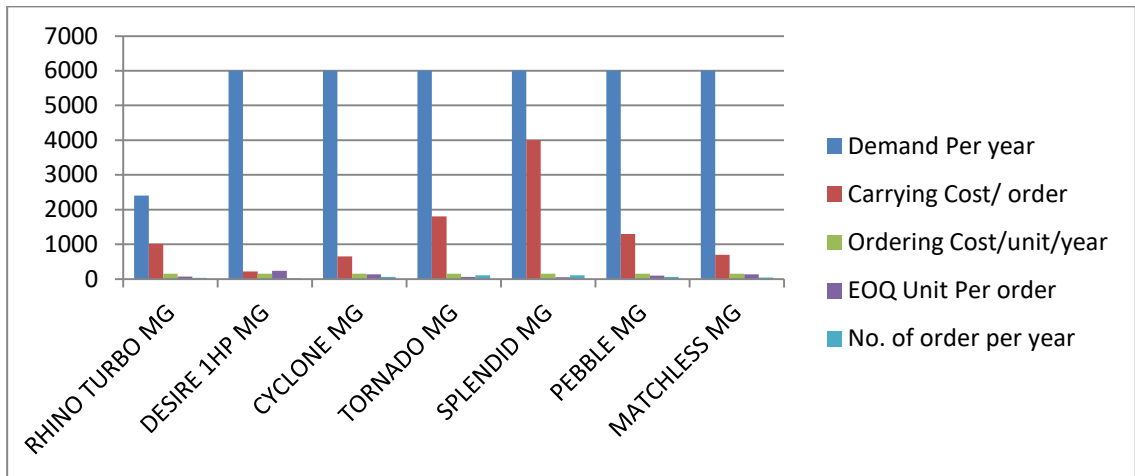


Chart 4.4.3 Chart representing EOQ, Demand, carrying cost, ordering cost -2

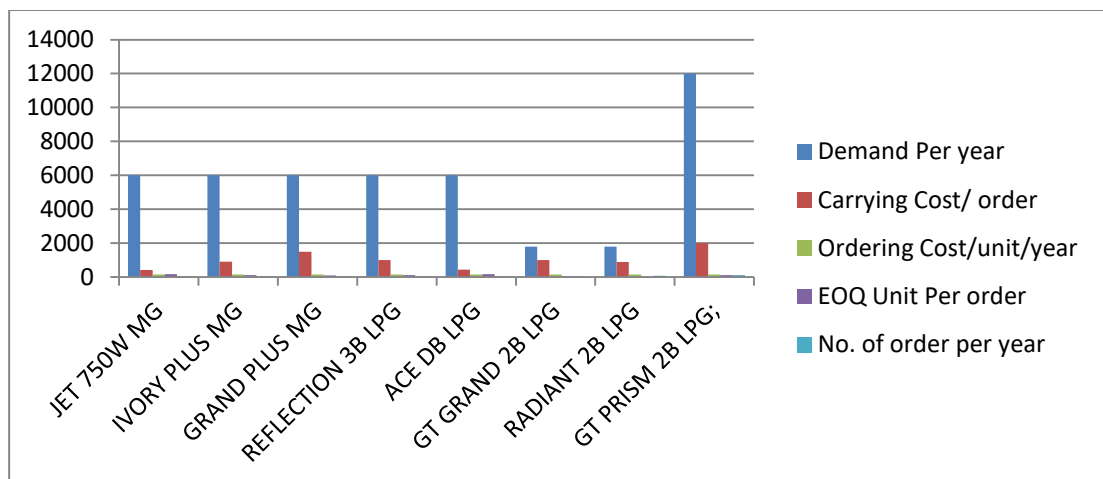
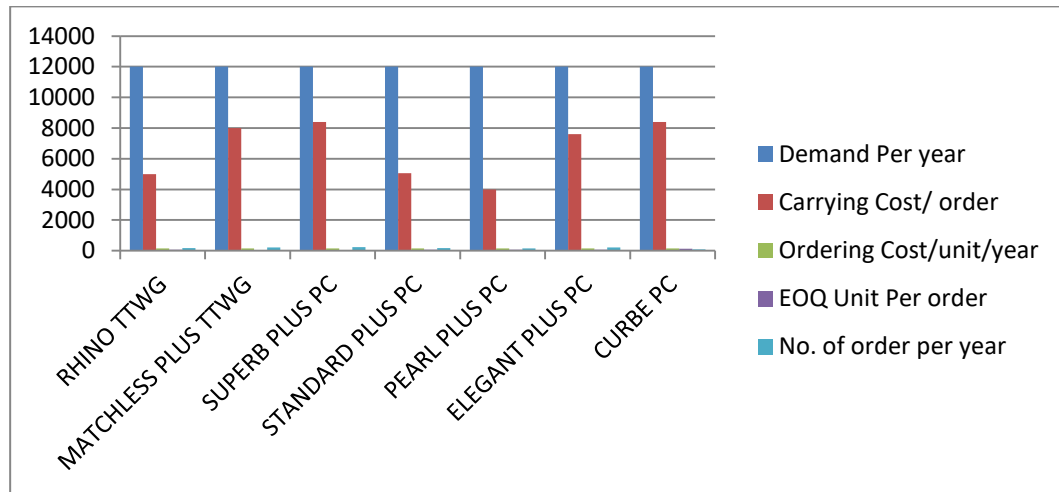


Chart 4.4.4 Chart representing EOQ, Demand, carrying cost, ordering cost -3



INTERPRETATION

The above table 4.4.1 represents the EOQ & the no. of orders purchased per year for various components which are calculated with the requirement of respective component per year. Calculated EOQ is compared with the no. of units of each component purchased in the organization.

The above calculation shows that, there is a variation in the EOQ & no. of unit's purchase which is not economical. Due to which the company is not satisfied and management is not following EOQ technique for purchasing of materials.

4.5 STOCK LEVELS

During 2016-17

The company requires 17012 units of kitchen appliances to manufacture for the year

2016-17. EOQ is 1700 units. The company makes safety stock equal to 30 day requirement and the

normal lead time is 10-20 days. The company works for 300 days in a year.

a. Reorder level = lead time*Average usage+ safety stock

$$= (10*96.29) +$$

$$= 17974.9$$

Safety stock = usage * period of safety stock/ total working days in a year

$$= 17012*30/300$$

$$= 1701.2$$

Average usage = usage/total working days in a year

$$= 17012/300$$

$$= 56.70$$

b. Minimum stock level = re-order level –(Average usage * Average lead time)

$$= 17974.9 - (56.70* 10+20/2)$$

$$= 17124.4$$

c. Maximum stock level = re-order level + re-ordering quantity-

(Minimum usage * minimum lead time)

$$= 17974.9+1700-(56.70*10)$$

$$= 19674.9-567$$

$$= 19107.9$$

d. Danger level = Average usage * Maximum re-order period for emergency purchases

$$= 56.70*20$$

$$= 1134$$

e. Average stock level = $\frac{1}{2}$ (Minimum stock level + Maximum stock level)

$$= \frac{1}{2}(17124.4 + 19107.9)$$

$$= 18116.15$$

During 2017-18

The company requires 123596 units of kitchen appliances to be manufactured for the year

2017-18. EOQ is 3335 units. The company makes safety stock equal to 30 day requirement and the

normal lead time is 10-20 days. The company works for 300 days in a year.

a. Reorder level = lead time * Average usage + safety stock

$$= (10 * 412) + 12360$$

$$= 16480$$

• Safety stock = usage * period of safety stock / total working days in a year

$$= 123596 * 30 / 300$$

$$= 12360$$

• Average usage = usage / total working days in a year

$$= 123596 / 300$$

$$= 412$$

b. Minimum stock level = re-order level – (Average usage * Average lead time)

$$= 16480 - (412 * 10 + 20/2)$$

$$= 10300$$

c. Maximum stock level = re-order level + re-ordering quantity-

(Minimum usage * minimum lead time)

$$= 16480 + 3335 - (412 \times 10)$$

$$= 19815 - 4120$$

$$= 15695$$

d. Danger level = Average usage * Maximum re-order period for emergency purchases

$$= 412 \times 20$$

$$= 8240$$

e. Average stock level = $\frac{1}{2}$ (Minimum stock level + Maximum stock level)

$$= 10300 + 15695 / 2$$

$$= 13000$$

$$72$$

During 2018-19

The company requires 106066 units of kitchen appliances to manufacture for the year

2018-19. EOQ is 3257 units. The company makes safety stock equal to 30 day requirement and the

normal lead time is 10-20 days. The company works for 300 days in a year.

a. Reorder level = lead time * Average usage + safety stock

$$= (10 \times 354) + 10606.6$$

$$= 141476$$

• Safety stock = usage * period of safety stock / total working days in a year

$$= 106066 \times 30 / 300$$

$$= 10606.6$$

• **Average usage = usage/total working days in a year**

$$= 106066/300$$

$$= 354$$

b. Minimum stock level = re-order level –(Average usage * Average lead time)

$$= 14147 - (354 * 10 + 20/2)$$

$$= 8837$$

**c. Maximum stock level = re-order level + re-ordering quantity-
(Minimum usage * minimum lead time)**

$$= 14147 + 3257 - (354 * 10)$$

$$= 13864$$

d. Danger level = Average usage * Maximum re-order period for emergency purchases

$$= 354 * 20$$

$$= 708$$

e. Average stock level = $\frac{1}{2}$ (Minimum stock level + Maximum stock level)

$$= 8837 + 13864 / 2$$

$$= 11350$$

$$73$$

During 2019-20

The company requires 184661 units of kitchen appliances to manufacture for the year

2019-20. EOQ is 6155 units. The company makes safety stock equal to 30 day requirement and the

normal lead time is 10-20 days. The company works for 300 days in a year.

a. Reorder level = lead time * Average usage + safety stock

$$= (10 * 615.53) + 18466.1$$

$$= 24621.4$$

• Safety stock = usage * period of safety stock / total working days in a year

$$= 184661 * 30 / 300$$

$$= 18466.1$$

• Average usage = usage / total working days in a year

$$= 184661 / 300$$

$$= 615.53$$

b. Minimum stock level = re-order level – (Average usage * Average lead time)

$$= 24621.4 - (615.53 * 10 + 20 / 2)$$

$$= 15389$$

c. Maximum stock level = re-order level + re-ordering quantity -

(Minimum usage * minimum lead time)

$$= 24621.4 + 6155 - (615.53 * 10)$$

$$= 24521.1$$

d. Danger level = Average usage * Maximum re-order period for emergency purchases

$$= 615.53 * 20$$

$$= 12310.6$$

e. Average stock level = $\frac{1}{2}(\text{Minimum stock level} + \text{Maximum stock level})$

$$= 15389 + 24521.1 / 2$$

$$= 27649.55$$

INTEPRETATION

For the past five years of period, the stock levels such as reorder level, safety stock, minimum stock level, maximum stock level, average stock level. danger level are maintained the demand of the products. Thus the same process is advised to follow for further development of the company.

5. FINDINGS, SUGGESTIONS AND CONCLUSION

5.1 FINDINGS

- The company is having good sales for their products during all the years of the study.
- The inventory turnover ratio is on a declining trend year after year in the period of the study.
- It indicates inefficiency of management in turning of their inventory into sales.
- The company should adopt sophisticated techniques to manage its inventory in a better manner.
- The EOQ calculated is suggesting that the company should obtain its inventory requirements by placing orders frequently to its suppliers rather than one time replenishment.
- Company should take measures for maintenance of proper stores and spares so as to avoid the frequent breakdown of the machinery.
- There is a need to develop good communication system between various departments like marketing, planning, procurement, and production and distributions functions.
- The company should follows Just-in-Time technique, their by it can do away with waiting time for a receipt of materials.

5.2 SUGGESTIONS

- It is recommended that to have a Total manufacturing system, a company-wide commitment, proper materials, quality, people and equipments must always be made available when needed. In addition; the policies and procedures developed and implemented for an internal structure should also be flexible. By integrating the production process; the supplier, manufacturers and customers become an extension of the manufacturing production process instead of independently isolated processes.

- As the company follows JIT for its purchasing materials, the company should continue with the same technique which will result in quality product and low cost of production.
- Under ABC analysis, the management should take remedial measures to control items belong to 'A class' than B & C class items, because A class constitutes more i.e., 80% of higher values. There should be strict control exercised on stock level, to avoid deterioration. This is done through maintaining low safety stock, continuous check on schedules & ordered frequently in inventories, in order to avoid over investment of working capital.
- The company is maintaining slow moving items more than fast moving items, which may create a gap between the production flows, which is against the smooth flow of functioning. So it is suggested to focus on procurement of the Fast Moving items.
- Company should update its policies and procedures with the required changes & amendments in the method time to time and implementation of such changes in JIT technique should be effectively done which helps to minimize wastage of material & enhance the profit of the company.

5.3 CONCLUSION

Inventory management has to do with keeping accurate records of finished goods that are ready for shipment. This often means posting the production of newly completed goods to the inventory totals as well as subtracting the most recent shipments of finished goods to buyers. When the company has a return policy in place, there is usually a sub-category contained in the finished goods inventory to account for any returned goods that are reclassified or second grade quality. Accurately maintaining figures on the finished goods inventory makes it possible to quickly convey information to sales personnel as to what is available and ready for shipment at any given time. Inventory management is important for keeping costs down, while meeting regulation. Supply and demand is a delicate balance, and inventory management hopes to ensure that the balance is undisturbed. Highly trained Inventory management and high-quality software will help make Inventory management

a success. The ROI of Inventory management will be seen in the forms of increased revenue and profits, positive employee atmosphere, and on overall increase of customer satisfaction.

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APPENDIX- I
ARTICLE
A STUDY ON INVENTORY MANAGEMENT OF KITCHEN
APPLIANCES MANUFACTURING COMPANY IN CHENNAI

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Abstract: Inventory management must be tailored to the demands of the marketplace while also supporting the company's strategic goals. Due to the extreme market fluctuations, new opportunities as a result of global marketing, global sourcing of materials, and new manufacturing technology, many businesses must change their inventory management strategy and inventory control process. This well-known system provides data for effectively managing material flow, maximizing the use of people and equipment, coordinating internal operations, and communicating with customers. Inventory management does not make decisions or oversee operations; instead, it provides data to managers who use it to make more precise and timely decisions. The primary goal of this project is to investigate and comprehend the inventory management practices used by a Kitchen Appliances Manufacturer in Chennai.

Index Terms – Inventory management, Technical Analysis, Kitchen Appliances

I. INTRODUCTION

Inventory management and provide chain management are the backbone of any business operations. With the event of technology and availability of method driven computer code applications, inventory management has undergone revolutionary changes. In any business or organization, all

performs are interlinked and connected to every alternative and are typically overlapping. Inventory management may be a vital function that determines the health of the provision chain as well because it impacts the monetary health of the balance sheet. Each organization perpetually strives to take care of optimum inventory to be able to meet its needs and avoid over or underneath inventory that may impact the financial figures.

II. REVIEW OF LITERATURE

- **Edwin Sitienei and Florence Memba (2015)** Conducted a study on Effect of Inventory Management on profitability of Cement Manufacturing Companies in Kenya. The study concluded that Gross profit margin is negatively correlated with the inventory conversion period
- **Srinivas Rao Kasisomayajula (2014)**. The study concluded that all the units in the commercial vehicle industry have significant relationship between Inventory and Sales.
- **KeahChoon Tan (2014)** This research reviews the literature base and development of supply chain management from two separate paths that eventually merged into the modern era of a holistic and strategic approach to operations, materials and logistics management.
- **Soni (2012)** The analysis used a sample of 11 companies for a period five years, that is, 2004–2009 and was done using panel data set. The adequate and timely flow of inventory determines the success of an industry. She concluded that size of inventory enhanced marginally over the period as compared to a hike in current assets and net working capital.
- **Nyabwanga and Ojera (2012)**. The study inferred that inventory comprised the maximum portion of working capital, and improper management of working capital was one of the major reasons of SSE failures.

III. OBJECTIVES OF THE STUDY

i. Primary objective

Through inventory analysis techniques, learn about the inventory management, strengths and weaknesses of Kitchen Appliances Manufacturer.

ii. Secondary objective

- To study about the ordering levels for the important components of inventory.
- To understand and measure economic order quantity for the selected raw material items.
- To analyze its inventory management methods with the help of ABC analysis and Trend Analysis.

IV. SAMPLING TECHNIQUES

The sampling techniques used in this study are,

- i. Trend Analysis
- ii. ABC Analysis
- iii. Economic Order Quantity

V. DATA ANALYSIS AND INTERPRETATION

- This study will be of the analytical variety. In analytical research, the researcher must use available facts or information and analyze it in order to make a critical evaluation of the material, as in this project.

1. TREND ANALYSIS

- **RATIO OF INVENTORY TO CURRENT ASSETS**

Table 1. Ratio of inventory to current assets

Trend Analysis of Inventory to Current Asset (in lakhs.)			
YEAR	INVENTORY	CURRENT ASSET	RATIO
2015-16	12382.2	40554.99	30.53%
2016-17	10879.94	24045.34	45.25%
2017-18	12513.37	29597.53	42.28%
2018-19	14210.29	28723.91	49.47%
2019-20	17011.36	31296.28	54.36%

Interpretation

From this trend analysis, the ratio of inventory to current asset for the last five

years of period is lies between 30% to 50%. And the amount of the inventory is around 100-150 lakhs always.

- **INVENTORY TURNOVER RATIO**

Table 2 Inventory Turnover Ratio

INVENTORY TURNOVER RATIO (in lakhs.)				
Year	Sales	Inventory	Inventory Turnover Ratio	Storage Period
2015-16	53400.00	12382.2	4.31	62
2016-17	44734.60	10879.94	4.11	45
2017-18	54056.00	12513.37	4.32	60
2018-19	65198.00	14210.29	4.59	52
2019-20	67870.00	17011.36	3.99	49

Interpretation

From this trend analysis, the inventory turnover ratio for the last five years of period is lies between 3.5-4 And the amount of the inventory is around 100-150 lakhs always with the average storage period of 50 days.

- **FINISHED GOODS TURNOVER RATIO**

Table 3 Finished Goods Turnover Ratio

FINISHED GOODS TURNOVER RATIO (in lakhs.)				
Year	Sales	Avg. Stock of FG	FG Turnover Ratio	Holding Period
2015-16	53400.00	2932.15	18.21	60
2016-17	44734.60	1989.39	22.49	66
2017-18	54056.00	3078.01	17.56	58
2018-19	65198.00	4547.12	14.34	51
2019-20	67870.00	5042.71	13.46	49

Interpretation

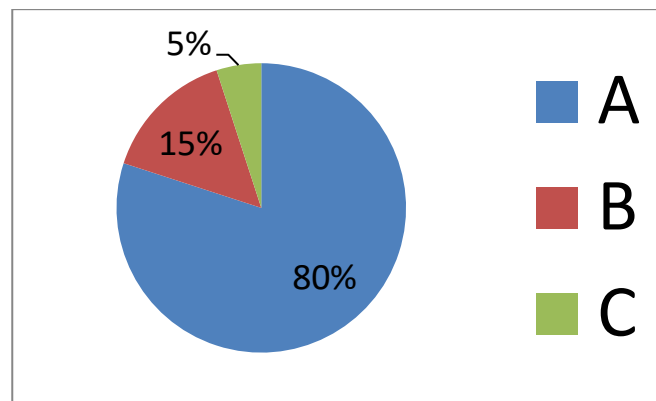
From this trend analysis, the finished goods turnover ratio for the last five years of period is lies between 14-18 and the average stock of the finished goods is always above 2000 lakhs with the holding period of 55 days.

2. ABC ANALYSIS

Table 5 ABC analysis

ABC ANALYSIS				
Category	Item	% of the item in inventory	Revenue of the item (in lakhs)	Revenue % of the item
A	LPG,MIXIE	70%	44578.4	80%
B	TTWG, COOKER	20%	9085.6	15%
C	F& B	10%	2630.4	5%

Chart 1. ABC analysis



Interpretation

From the above table 5 ,the classification of various components as A,B & C classes using ABC analysis techniques based on unit value. Here, LPG

& Mixie are taken as A category which gives more than 80% of revenue, Table Top Wet Grinder taken as B category which gives over 15% of revenue and Flasks and bottles are taken as C category which gives around 5% of revenue to the total revenue of the company.

3. ECONOMIC ORDER QUANTITY (EOQ)

Table 6 .Economic order quantity (EOQ) of each product

Components (names are hideous)	Demand Per year	Carrying Cost/ order	Ordering Cost/ unit/year	EOQ Unit Per order	No. of order per year
RHINO MG	2400	1010	150	68.93	34.81
DESIRE HP MG	6000	222	150	232.49	25.80
CYCLONE MG	6000	655	150	135.35	61
TORNADO MG	6000	1800	150	57.75	103.89
SPLENDID MG	6000	4000	150	54.77	109.66
PEBBLE MG	6000	1300	150	96	63
MATCHLESS MG	6000	700	150	130.93	45.82
JET 750W MG	6000	420	150	169	35.49
IVORY PLUS MG	6000	899	150	115.90	44.77
GRAND PLUS MG	6000	1500	150	89.44	67.08
REFLECT LPG	6000	1000	150	109.54	54.79
ACE DB LPG	6000	445	150	164.21	36.58
GRAND 2B LPG	1800	999	150	60.20	30
RADIANT 2B LPG	1800	885	150	24.64	73.05
GT PRISM LPG	12000	2000	150	109.54	110
RHINO TTWG	12000	5000	150	69.28	173.91

Chart:2. EOQ unit per order

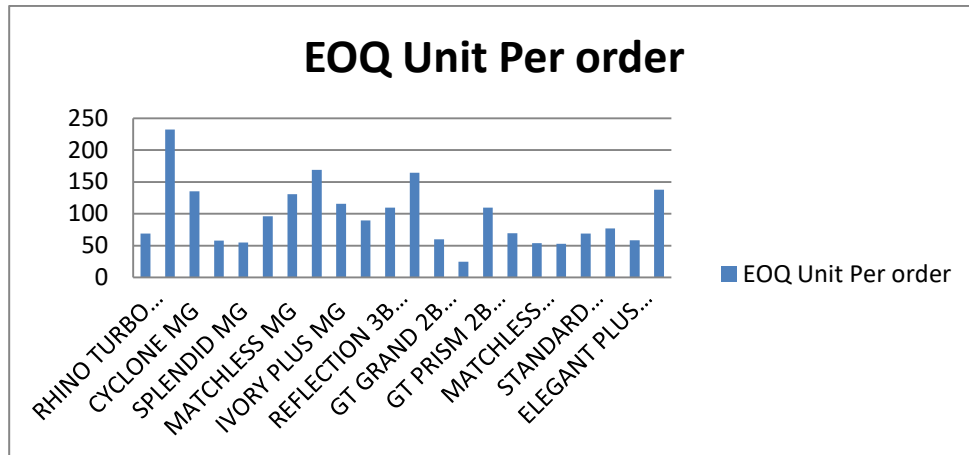


Chart 3. EOQ, Demand. carrying cost, ordering cost -1

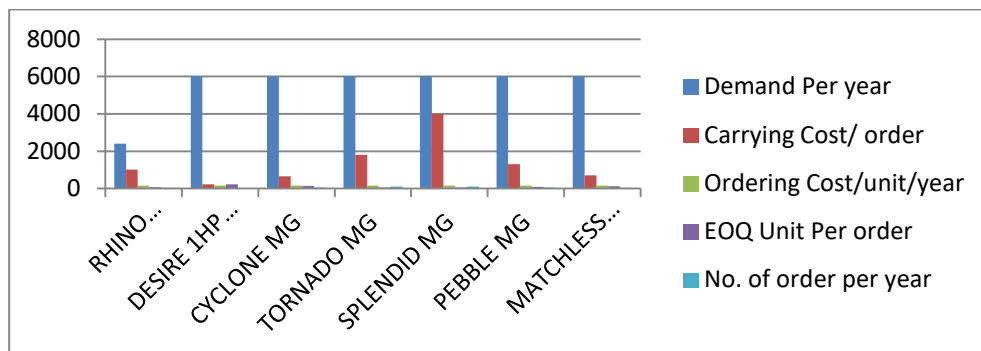
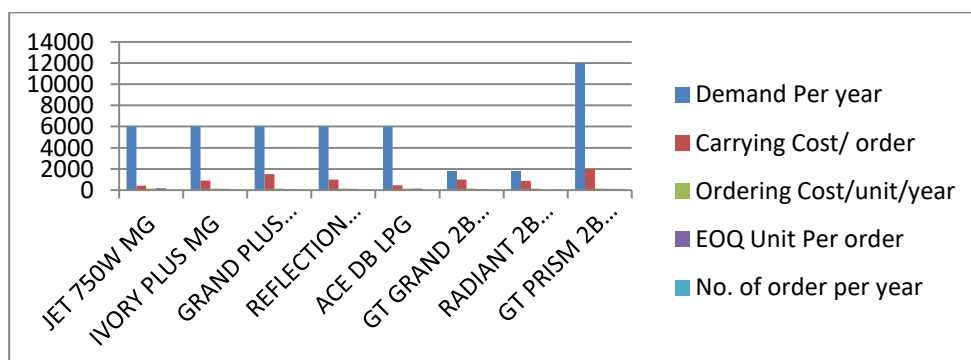


Chart 4. EOQ, Demand. carrying cost, ordering cost -2



Interpretation

The above table 6 represents the EOQ & the no. of orders purchased per year for various components which are calculated with the requirement of respective component per year. Calculated EOQ is compared with the no. of units of each component purchased in the organization.

The above calculation shows that, there is a variation in the EOQ & no. of unit's purchase which is not economical. Due to which the company is not satisfied and management is not following EOQ technique for purchasing of materials.

VI. CONCLUSION

Inventory management has to do with keeping accurate records of finished goods that are ready for shipment. This often means posting the production of newly completed goods to the inventory totals as well as subtracting the most recent shipments of finished goods to buyers. When the company has a return policy in place, there is usually a sub-category contained in the finished goods inventory to account for any returned goods that are reclassified or second grade quality. Accurately maintaining figures on the finished goods inventory makes it possible to quickly convey information to sales personnel as to what is available and ready for shipment at any given time. Inventory management is important for keeping costs down, while meeting regulation. Supply and demand is a delicate balance, and inventory management hopes to ensure that the balance is undisturbed

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