"A STUDY ON INVENTORY MANAGEMENT IN SUJANA METAL PRODUCTS LIMITED"

A Project report submitted to Jawaharlal Nehru Technological University, Hyderabad, in partial fulfillment of the requirements for the award of the degree of

MASTER OF BUSINESS ADMINISTRATION

By

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Under the Guidance of

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Hyderabad

2010-2012

CERTIFICATE

This is to certify that the project entitled "**A STUDY ON INVENTORY MANAGEMENT"** has been submitted by Ms. K.V.SUNITHA (Reg. No. 10241E0045) in partial fulfillment of the requirements for the award of Master of Business Administration from Jawaharlal Nehru Technological University, Hyderabad. The result embodied in the project has not been submitted to any other University or Institution for the award of any Degree or Diploma.

Internal guide

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DECLARATION

I hereby declare that the project entitled **"**A **study on Inventory management at Sujana metal products Ltd"** submitted in partial fulfillment of the requirements for award of the degree of MBA at Gokaraju Rangaraju Institute of Engineering and Technology**,** affiliated to Jawaharlal Nehru Technological University, Hyderabad, is an authentic work and has not been submitted to any other University/Institute for award of any degree/diploma.

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ACKNOWLEDGEMENT

Firstly I would like to express our immense gratitude towards our institution **Gokaraju Rangaraju Institute of Engineering & Technology,** which created a great platform to attain profound technical skills in the field of MBA, thereby fulfilling our most cherished goal.

I would thank all the finance department of SUJANA METAL PRODUCTS LTD **Mr. Satish kommineni Deputy Manager (finance & accounts),** and the employees in the finance department for guiding and helping me in successful completion of the project

I sincerely express my gratitude to the principal **Dr. J. N. MURTHY** and for his inspiration and timely support in successful completion of my project work.

I am very much thankful to our **K. Surya narayana** (Internal Guide) for extending his guidance and cooperation in doing this project.

I am also thankful to our project coordinator **Mr. S. Ravindra Chary** for extending his cooperation in completion of Project.

I convey my thanks to my beloved **parents, friends and my faculty** who helped me directly or indirectly in bringing this project successfully.

K. V. SUNITHA
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CHAPTER-1
INTRODUCTION

INTRODUCTION

Financial Management is concerned with the duties of the finical manager in the business firm. Financial managers actively manage the financial affairs of any type of business, namely financial and non-financial, private and public, large and small, profit seeking and non-profit. They perform such varied task, as budgeting, financial forecasting, cash management, credit administration, investment analysis, funds management and inventory management.

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:

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

The job of the financial manger is to reconcile the conflicting view points of the various functional areas regarding the maximizing the owners wealth. Thus, inventory management, like the management of other current assets , should be related to the overall objective of the firm. It is in this context that the present chapter is devoted to the main elements of inventory management from the view point of financial management.

The objective of inventory management is explained in some detail sections. Section two is concerned with inventory management techniques. Attention is given here to basic concepts relevant to the management and control of inventory.

The aspects covered are:

- Determination of the type of control required.
- The basic economic order quantity
- The reorder point, and
- Safety stocks.

As a matter of fact, the inventory management techniques are a part of production management. But a familiarity with them is of great help to the financial managers in planning and budgeting inventory.

NEED TO HOLD INVENTORIES

Martin and miller identified three general motives for holding inventories

TRANSACTION MOTIVE:

This refers to the need of maintaining inventory to facilitate smooth production and sales operations.

PRECAUTIONARY MOTIVE:

Precautionary motive for holding inventory is to provide a safeguard when then actual level of activity is differ than anticipated. This inventory serves when there is a unpredictable changes in the demand and supply forces.

SPECULATIVE MOTIVE:

This motive influences the decision to increase or decrease the levels of inventory to take the advantage of price fluctuations.

OBJECTIVE OF THE STUDY

- 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, VED analysis etc.
- To evaluate the inventory management practices of **SUJANA METAL PRODUCTS LIMITED.**
- To offer suitable suggestions for the improvement of inventory management practices.

SCOPE OF THE STUDY

Inventory management is a simple concept-don't have too much stock and don't have too little. Since there can be a substantial costs involved in staying above and below the optimal range, careful inventory management can make a huge difference in the right balance can be quite a complex and time consuming task without the right technology.

Inventory management is very important for "SUJANA METAL PRODUCTS LTD". It enables the business to meet or exceed expectations of the customers by making the products readily available/

The scope of the study includes the ABC Analysis of Raw Materials, work in progress and finished goods for four financial years.

This study provides insight to the management of high value items and also brings attention of management towards movement of 'A' class items over period of 4 years

LIMITATIONS OF THE STUDY

- Detail study about all the material was not possible because of time limit.
- Some of the information was kept confidential by the stories department.
- Study was confined only to the selected components in the stores department.

RESEARCH METHODOLOGY

The data has been gathered through interaction and discussions with the executives working in the division.

Some important information has been gathered through couple of unstructured interviews of executive.

Annual reports and other magazines published by the company are used for collecting the required information.

CHAPTER-II
INDUSTRY PROFILE
COMPANY PROFILE

INDUSTRY PROFILE

Steel is versatile and indispensable item. Iron and steel comprises one of the most important inputs in all sources of economy. This industry is both a basic and a core industry. The economy of any nation depends on a strong iron and steel industry in that nation history has shown that countries having a strong potentiality for iron steel products have played a predominant role in the advancement of civilization in the world. The great investment that has gone in to the fundamental research in iron and steel industry has helped both directly and indirectly many modern fields of today's science and technology.

The rapid growth and development of steel capacity is indeed a logical corollary of any program of rapid industrialization. Steel forms the backbone of the economy, especially of any industrial country. It has backward and forward linkages, which makes steel indispensible. The vital role, which steel industry play in the growth and development of nation's economy, is undeniable.

The important of steel in economic activities cannot be overemphasized. Besides, steel provides large employment directly and it acknowledgement that for every direct steel employee, 15 thousand opportunities are indirectly in the linkage industries.

Steel, a core sector industry, emerged as the backbone for industrialization in most of the countries. The index for steel production and for capita consumption of steel in a country has becoming measuring scales of economic growth and reconstruction of a nation.

Steel occupies strategies position in 5efforts to attain a solid and self reliant industry base. In spite of the iron and steel industry being a capital, labor energy intensive industry, subjected to rapid, up-predations the astonishing fact is that, 85% of the metals produced in the world, is accounted by steel alone. Hence, steel is identified as an international industry, with global focus on steel making and steel technologies, emphasizing quality, production, and cost reductions.

FUTURE DEMAND

Indian steel industry plays a significant role in the country's economic growth. The major contribution directs the attention that steel is having a stronghold in the traditional sectors, such as infrastructure & construction, automobile, transportation, industrial applications etc. moreover, steel variant stainless steel is finding innovative applications due to its corrosion resistive property. Indian is the fifth largest steel producer at the global front and struggling to become the second producer in the coming years.

"Indian steel industry outlook to 2012" is an outcome of an extensive research and conceptual analysis of the Indian steel industry. The report provides detail information on steel industry in India. The report also presents an insight into the future outlook of various vertical industry segments, including automotive, aerospace, margin, consumer durables, power, railways, telecom, and housing. The report classifies the finished steel product market into two categories- Alloy and Non-Alloy. The report also covers information on industry-wise steel demand, overall

Steel consumption, production, and trading market. Besides, it provides industry forecast for differ market segment.

Steel authority of India(SAIL)LTD has planned to enhance its hot metal production capacity from the level of 13.82 million tons per annum (MTPA) to 23.46 MTPA under its current phase of expansion and modernization to be which is expected to be completed by financial year 2012-2013.

SAIL would increase its capacity further to 26.18 MTPA. The indicative investment for current phase is about US$ 13.28 billion. Additionally, approximately US$ 2.21 billion has been earmarked for modernization and expansion of sail mines.

The steel consumption in the country will surge at a CAGR of around 7% during FY 2012-2014.

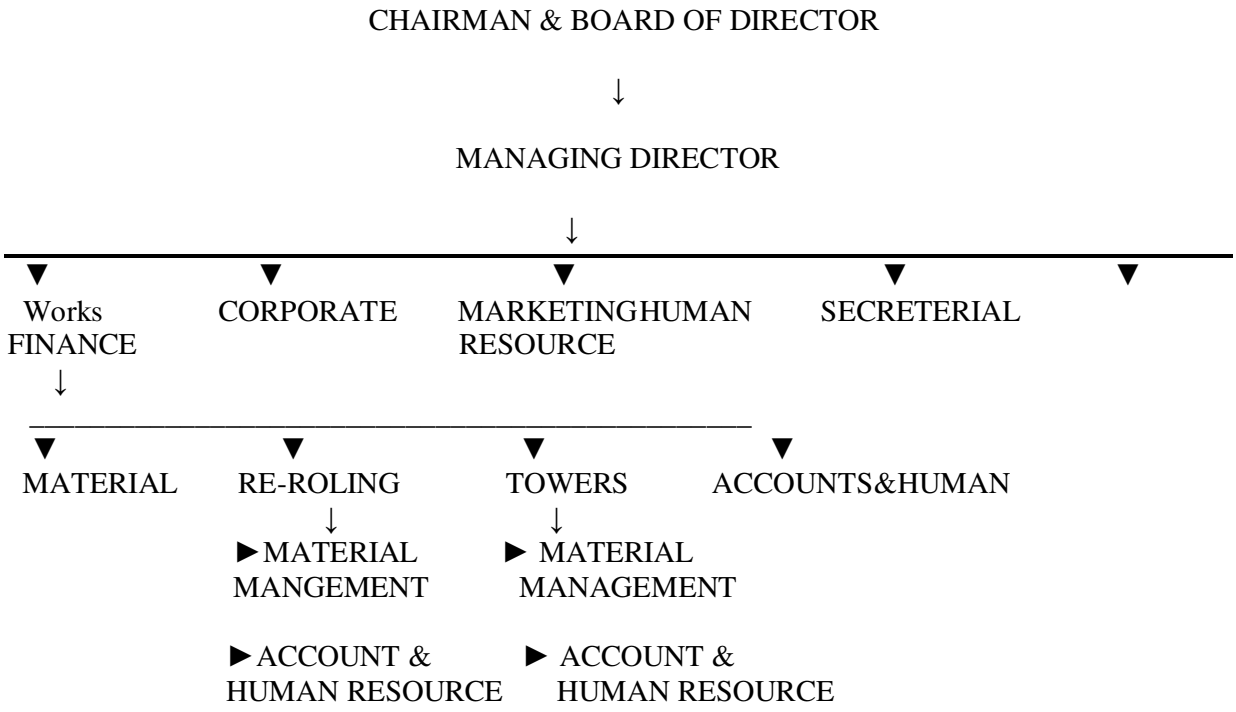
PRESENT DEMAND IN INDIA:

- India's annual steel demand is seen rising by 10 percent in the fiscal year to march 2011, helped by higher spending on infrastructure.
- India's budget for 2010/11, which was announced by finance Minister Pranab mukherjee proposed to invest 1.73 trillion rupees on infrastructure, a measure cheered by the steel industry.
- Steel production in the 2010/11(April-March) fiscal year is likely to be 65 million tons, compared to 60-61 million tons of in the current year.
- India has consumed 63.55 million tons of steel in 2009-10 compared to 58.28 million tons in the previous year.
- With nearly 80 million tons per annum installed capacity, India is currently the world's fifth-largest producer of crude steel.

PAST DEMAND IN INDIA:

Moreover, the performance of the industry largely depends on the country's economic growth, and the stable government at the centre will give more emphasis to the infrastructure development. Programs announced by the government earlier will be accelerated. Also, the growth in automobile sector will spur the steel demand.

- The steel demand significantly slumped during the third quarter of FY 2008-09 ending December 2008, having seen three years of average 15%-20% growth. However, the fourth quarter which ended March 31, 2009 posted an increase of 3.8% compared to the corresponding quarter previous year i.e. the quarter ending March 31, 2008.
- The joint plant committee, a data dissemination body under the central Ministry of steel, has recently released the steel industry's statistics showing that the steel production stood at 56.4 million Metric Tons in the year ended March 2009 against the revised output of 56.1 million Metric tons in FY 2007-08.


CHAIRMAN & BOARD OF DIRECTOR
MANAGING DIRECTOR
Works FINANCE
CORPORATE
MARKETING
HUMAN RESOURCE
SECRETERIAL
MATERIAL
RE-ROLING
TOWERS
ACCOUNTS&HUMAN
►MATERIAL MANGEMENT
► MATERIAL MANAGEMENT
►ACCOUNT & HUMAN RESOURCE
► ACCOUNT & HUMAN RESOURCE

GLOBAL STEEL SCENARIO:

It is interesting to note that the world's total crude steel production grew at a much slower rate during the first half of the century and the growth rate picked up at a significance rate after II World War, with a meager production level of 28.3 MT in 1900, the production crossed the first hundred mark in 1927 (101.8 MT). The production in 1943 was 159.6 MT and then it sharply fell to 111.6 MT in 1946. Then the growth 529.8 MT in 1968, 650.7 MT in 1972, 703.8 MT in 1974 and the highest ever production of 764.4 MT in 1979. During the 70's it witnessed one of the most severe economic crisis on account of petroleum oil. This had a pronounced impact on overall economy of the world and particularly steel industry. The world production of steel started declining to 644.4 MT in 1982. The production improved to 683.7 MT in 1983, 710.2 MT in 1984, 719.1 MT in 1985, and 714.2 MT in 1986.

Among the top steel producing countries of the world, the USA maintained the position as the biggest steel producer until 70's, when the Erstwhile USSR taken over the USA and has remained on the top of the world since then. In the process Japan also developed its steel Industry significantly and took over the USA to become the first biggest producer in the world.

GLOBAL PERPECTIVE IN STEEL:

World Demand:

Total demand for steel in the world is expected to grow at an annual rate of 1.7% between 1935 and 2000 according to a study by chase econometrics. According to this estimate, total demand in the year 2000 is expected to be 913 MT of crude steel. The world growth rate of 1.7% per annum disguises dramatic differences in steel demand growth. Within the non-socialistic world, steel demand in advance industrial countries at a whole are expected to grow at 0.6 % annual rate following a 2.2% annual rate between 1974 and 1984. Steel demand in less developed countries as a whole is expected to grow at a 5.5% annual rate up to 2000 following a 3.1% annual growth rate between 1974 and 1984. Within the centrally planned economies category, the Eastern Europe erstwhile USSR region may have a 0.3% annual steel demand growth during the period 1974–84. Steel Demand rate up to the end of this century after a 7.8% per annum growth during 1974 – 84.

THE INDIAN STEEL SCENARIO:

Steel consumption in India has gone up during the past decade from the level of 10 MT (1993-94). Similarly pig iron consumption has gone up from 1.4 MT to about 1.8 MT. The past decade was not significant only for higher growth rate of iron and steel consumption has gone up from 1.4 MT to about 1.8 MT. The past decade was not significant only for higher growth rate of iron and steel consumption in the country compared to previous few decades (during 1960-61 steel consumption in the county has gone up from 3.6 MT to 8.9 MT only), but some vital events have also taken place which brought an overall change in the Indian Steel Scenario.

During the 80's decade, all main steel producers have taken a number of steps to modernize the technology and products of their steel plants. A number of major secondary products have entered in the integrated steel production activities in a big way. Some of them have also entered into sophisticated production area of higher quality cold rolled sheets and coated sheets. The recent policy of the government of India for liberalizing the Indian iron and steel sector from age-old control and equalized freight system has changed the basis structure of the industry

Thoroughly. The policy of liberalized import has also put the Indian steel industry open to global competition.

DEVELOPMENT OF STEEL INDUSTRY IN INDIA:

The development of steel industry in India should be viewed in conjunction with the type and system of government that had been ruling the country. The production of steel in significant quantity started after 1900. The growth of steel industry can be conveniently studied by dividing the period into pre and post independence era (or before 1950 and after 1950). The total installed capacity during the pre Independence era was 1.5 MT/ year, which has risen to about 9 MT of ingot by the 70's. This is the result of the bold steps taken by the government to develop the sector.

GROWTH IN CHRONOLOGICAL TERMS:

- 1830 : Joshia Marshall Health Constructed the First

  Manufacturing Porto. Nova in Madras Presidency. However it was a financial failure.
- 1874 : James Erskine founded the Bengal Iron Works.
- 1899 : Jamshedji Tata initiated the scheme for integrated steel plant.
- 1906 : Formation of TISCO.
- 1911 : TISCO started production.
- 1918 : TISCO started production.
- 1940-50 : Formation of Mysore Iron Steel Ltd., at Bhadravathi in Karnataka.

SWOT ANALYSIS OF INDIAN STEEL INDUSTRY:

STRENGTHS:

- India has been bestowed with high reserves of basic raw materials for steel making. The country has about 12 BT of iron ore; 25 BT of cooking coal; 11.6 BT of manganese ore; 9.75 MT of flux grades limestone and 1.7 BT of dolomite. Except high ash content in coal, all minerals are of most suitable quality and hence then India has been comfortably placed when compared to any other country in the world
- India has large number of qualified and experienced metallurgists, engineers and technicians, who can engineer, adopt and assimilate cost effective technologies for making and shaping of steel
- Maintaining an edge in cost and quality competitiveness in the export markets, low labor cost (15% of the steel) and well trained human resource as well as good quality inputs, is one of the major strengths of the Indian Steel Industry.

WEAKNESSES:

- High capital, labor and energy intensive. Industry establishment involves long gestation period.
- Slow growth rate in domestic as well as international demand..
- Total dependence of scrap, resulting in hug scrap imports further up trend in scrap prices to reduce profitability
- Poor capacity utilization of steel units due to inadequate infrastructure facilities and inadequate short term and long term planning
- High and rising power costs and low availability of power are becoming a burden to steel industry

OPPORTUNITIES:

- Per capita consumption of steel in India is less than 30 kg, which is less than one fifth of the world average, this means huge potential for steel consumption as well as latent demand.
- Presently the sector is almost entirely open with no licensing, pricing distribution and import control. There are no restriction on capacities
- The government has made changes in the industrial policy. Steel production which has earlier restricted for public sector also. Further there are no restrictions on capacities.
- Huge export potential to South East Asian Countries, Gulf and neighboring countries exist being cost and quality competitive

THREATS:

- World steel industry is ploughed by recession due to the following reason: matured markets for used industries like automobiles, appliance, and continuous effort to cut costs, capacities, jobs and striving for more corporate exports.
- Severe threat of technical obsolesces due to rapid development in secondary steel making technologies, exists in Indian steel industry.
- Diseconomies of scale of operation by various mini steel plants and inadequate investment opportunities for modernization and up gradation due to high cost of inflation and rising interest and financing rate posing a major threat to the industry as a whole.

TYPES OF STEEL PLANTS IN INDIA:

The major types of steel plants:

1. Integrated Steel Plants.
2. Mini Steel Plants.
3. Re-rolling Steel Plants.
4. Alloy & Special Steel Plants.

INTEGRATED STEEL PLANT:

The characteristics of Integrated Steel Plant are as follows:

- Have large installed capacities.
- Are highly capital intensive.
- Are labors intensive?
- Have all facilities including raw material resources, water supply. Township facilities etc., all under one administrative control.
- All operations (from procurement of raw materials and processing to finished products) under administrative control.
- Independent of processing units.
- Source of earning foreign exchange.
- Integrated Steel Plants in India are the one set at Rourkela, Bhilai, Durgapur, Bokaro, andIISCOandTISCOandVSP.

PRODUCTS FROM INTEGRATED STEEL PLANTS:

- Flat Products (Sheets, Plates etc.,).
- Structural Products.
- Wire rod Products.
- Blooms, billets and slabs.
- Railway track materials (rails, sleeper, bars).
- Pig iron.

2. MINI STEEL PLANTS:

The characteristics of Mini Steel Plants are as follows:

- Low gestation, low investment cost, low BEP.
- Effective installation and utilization of electric are furnace and continuous casting units
- Can be set up at market centers or near raw material resources
- Environmental pollution in negligible

3. RE-ROLLING STEEL PLANTS:

The characteristics of Re-rolling Steel Plants are as follows

- Small installed capacities.
- Need special types of plants & equipment like high frequency induction furnace, melting units etc.,
- They need special type of technology at every stage.

  E.g.: melting, rolling, finishing etc.,

4. ALLOY & SPECIAL STEEL PLANTS :

The characteristics of Alloy & Special Steel Plants are as follows

- Small installed capacities.
- Need special types of plants & equipment like high frequency induction furnace, melting units etc.,
- They need special type of technology at every stage.
  E.g.: melting, rolling, finishing etc.,

ALLOY SPECIAL STEELS:

The consumption of alloy steels in India has increased over period of time. In developed countries the consumption of alloy steel about 4-6% of that of total steel consumption.

The present age of consumption of alloy steel in India has been in the range 4-6% of mild steel during 1994 -98 period in line with international norms, it is seen that imports of alloy steels has been slowly increased and is around 100000 tons per year for the last two years, which is about ten percentage of indigenous production.

The alloy steel is generic name and generally subdivided into the following grades:

- Cold bearing quality
- Ball bearing quality
- Leaded free cutting quality
- Spring steel, electrode quality steel
- Stainless Steel
- Carbon Construction Steel
- Alloy Construction Steel

The demand for steel and metal in future will be driven quality. The process of producing quality steel products starts from the selection of raw materials.

CONCLUSION:

Overall industrial development of the country will necessarily call for a sound infrastructure development particularly in the area in transport, communication, and civil construction etc., this call for substantial consumption of steel, particularly non flat products.

COMPANY PROFILE

THE EVOLUTION

A decade ago, a group of young engineers came together to give shape to along held vision. That vision is truly the blue chip Rs. 6820 million turnover sujana groups, with significant presence in South India.

SUJANA GROUP:

The south India based sujana Group, in little over decade, has emerged as one of the regions important economic player and a force to be reckoned with.

The constituent companies of the Group are:

- Sujana Industries Limited.
- Sujana Steels Limited.
- Padmini Steels Corporation Limited.
- Sujana Powergen (Tuticirin) Limited.
- Sujana Power (Gangikondan) Limited.
- Sujana Corporation Limited.

MISSION:

- To achieve global standards in excellence in manufacturing and trading in various ranges of products and appearance and domestic and international markets, caring for customer satisfaction.
- Create infrastructure with a skilled human resource and modern technological base for development of business.
- To register growth step by step and develop strategies to face new challenges in a liberalized market economy and globalization.
- To generate adequate return on investment to meet the interest of share holders and investors by achieving high standards of productivity and quality.
- To enrich and enhance employees growth and contribution by fostering groups corporate culture, values and ethos.

OBJECTIVES:

- Maintain smooth and uninterrupted supply of products by keeping adequate inventories and stocks; to ensure product availability in all markets.
- Optimize utilization of existing infrastructure and operate at installed capacities to maximize production and enhance efficiency.
- Shore up man power skills and technical expertise aimed at self – reliance implementation of expansion programs and diversification of plans.
- To consolidates and sustain growth by developing suitable structure, inducting monitoring system for cost effectiveness and exercising controls at levels for effective functioning.

INHERENT STRENGTHS:

- ✓ Survived through turbulent times of industry.
- ✓ BIS Standard compliance quality products.
- ✓ Strong core technical team and low employee turnover.
- ✓ Capacity for flexible designs and small batch sizes.
- ✓ Efficient use of infrastructure.

OPPORTUNITIES:

- ✓ Market value added products through innovation and development.
- ✓ Good growth prospects for galvanized towers for power transmission and telecom.
- ✓ A strong growth in infrastructure industry.
- ✓ Growth in housing sector expected to continue.
- ✓ Increased export demand for galvanized products and reduction of tariff barriers.
    - o Waiver of anti – dumping duty by VSA.
    - o Concessional tariffs for SAARC countries.

STRATEGIES:

Taking advantages of liberalization policies, the group has devised strategies to

- ✓ Identify the thrust areas and steels and bearings
- ✓ Diversify into infrastructure areas
- ✓ Add and expand its existing plant capacities.
- ✓ Maintain its global standards of excellence.
- ✓ Emerge as a key player both in domestic and international markets.

OBLIGATIONS:

- ❖ Towards Shareholders:
  - ✓ To ensure growth projection are matched by performance to build confidence and goodwill.
  - ✓ To ensure a reasonable annual dividend commensurate with company's performance profits and future plans for investments

- ❖ Towards Customers and Dealers:
  - ✓ To provide a quality product and spread awareness amongst them for competitive selling in buyers marked backed by world class customer service.

- ❖ Towards Employees:

  - ✓ To develop and upgrade their skills through in – house and external training programs enabling careers progressions and advancement.
  - ✓ The inputs for upgrading managerial and operational skills are provided to meet present and future challenges.

- ❖ Towards the community:
  - ✓ To the ensure environmental protection in and around plant operational areas and promote development of community by participating in several activities.

AN EXTENSIVE PRODUCT RANGE:

The products of Sujana Metal Products come in comprehensive range:

- MS equal angles
- MS unequalled angles
- EN 8 rounds
- MS 8 rounds
- EN 8 squares
- MS flats
- HCS octagons
- CTD bars
- Flats
- Channels
- Beams

MARKETING EDGE:

- ✓ Wide marketing network – direct, trading houses, consignment agents etc.,
- ✓ Products approved.
- ✓ Experienced in international trading.
- ✓ Domestic customers include large and reputed corporate like L&T, Kirby, Nagarjuna, IVRCL, Madhucon global tele TATA tele, Power grid corporation etc.,

MILESTONES OF THE SUJANA GROUP:

1986 : A perfect engineer works was formed to manufacturing fans and perfect re-rolling mills was also formed to manufacture re-rolled construction steel rods.

1987 : Sujana Industries commenced its operations

1988 : Sujana Steels incorporated and commences operations

1989 : Sujana Corporation incorporated

1990 : Installed capacity of bearing division increased to 1.8 million per annum

1991 : Export of fans, bearing steels and granites commences

1992 : Sujana Industries offers rights issued to the tune of Rs 64.57 million

1993 : Sujana corporation's 100% EOU granite unit commences

1994 : Sujana introduce 'zephyr' range of decorative ceiling fans

1995 : The bearing capacity of Sujana Industry increases to 2.4 million per annum.

1996 : Sujana Industries goes in for private placement of equity shares

1997 : Sujana group allotted 2*105 MW power projects at tuticorin and gangikondan for implementation under international competitive bidding.

1998 : Sujana steels incorporates padmini corporation for setting up 125000 TPA modern steel rolling mill near Chennai

1999 : Sujana Group disinvest from Sujana corporation and name of the company changed to liberty corporation

2000 : Sujana Industries rated PRI (adequate safety) by CARE for short term debt instruments.

2001 : Sujana power projects received gas linkage from ministry of petroleum and natural gas.

2002 : Sujana implemented a new line of activity manufacturing of galvanized steel structures and tower parts

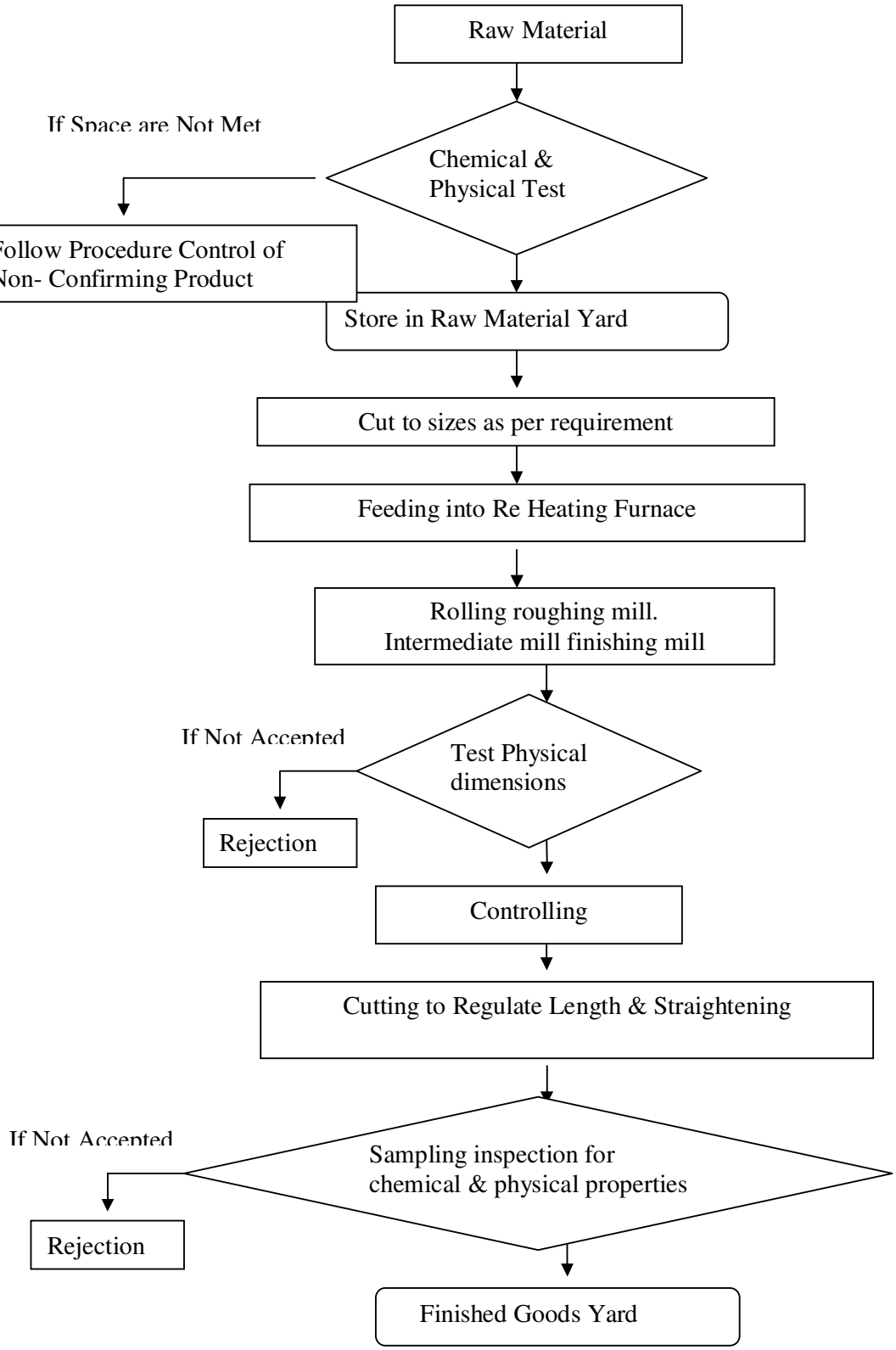
2003 : Sujana took up new development activity to find new users for the existing steel products and manufactures of new steel products – anti curvesiv steel, epoxy coated steel alloy steel etc.,

2004 : TMT (Termo mechanically Treated bars) – a new line advanced steel to resist the corrosion, was brought to market under the brand name of SUJANA TMT which is well accepted by the market.

SHAREHOLIDNG IN SUJANA METAL PRODUCTS LTD:

CATEGORY	% OF SHAREHOLDING
Promoter's holding	
Promoter	13.12
Personal A/c in concert	19.80
Non- Promoter's holding	
Industrial investors	
Banks/ Financial Inst	4.04
Others	
Private Corporate bodies	36.57
Indian Public	26.47
TOTAL	100.00

MANUFACTURING PROCESS



ORGANIZATION STRUCTURE:

Chairman	:	Y.S Chowdary
Managing Director	:	RK Birla
Directors	:	D. Srinivasaraju
		Y.V Rameshnaidu
		(IFCI Nominee)
		S. Hanumantha Rao
		T. Ramakrishna
		V.B Chadha
		K. Srinivasarao
		(IREDA Nominee)
		V. Malakonda Reddy
Financial Institution	:	IFCT LTD
		IDBI
Listing	:	Hyderabad Stock Exchange Ltd
		Somajiguda, Hyderabad
		Bombay Stock Exchange
		Dalal Street, Bombay
		Madras Stock Exchange
		112th Line beach, Chennai.
Bankers	:	Bank of Baroda
		Bank of Rajasthan
		Indus Ind. Bank Ltd.,
Share Transfer Committee	:	Y.S Chowdary
		R.K Birla
		G. Srinivasa Raju
Shareholder grievance	:	Y.S Chowdary
Committee		G. Srinivasa Raju
		S. Hanumantha Rao

CHAPTER-III
THEORITICAL FRAMEWORK

MEANING OF INVENTORY

Inventory is a list for goods and materials, or those goods and materials themselves, held available in stock by a business. It is also used for a list of the contents of a household and for a list for testamentary purpose of the possessions of someone who has died. In accounting inventory is considered an asset

TYPES OF INVENTORIES

Inventories play a major role in a business or depending on nature of the businesses. The inventories may be classified as under.

(I) Raw Materials

Materials and components scheduled for use in making a product. These are the basic inputs, which are converted into finished products through manufacturing process. Raw material inventories are those units, which have been purchased and stored for future production.

.(II) Work in process / Progress

Materials and components that have begun their transformation to finished goods. Materials issued to the stop floor, which have not yet become finished products they are value added materials to the extent of labor cost incurred.

(III) Finished Goods

A finished goods is a completed part that is ready for a customer order. These goods have been inspected and have passed final inspection requirements so that they can be transferred out of work-in-process and into finished goods inventory. From this point, finished goods can be sold directly to their final user, sold to retailers, sold to wholesalers, sent to distribution centers, or held in anticipation of a customer order.

STORES & SPARES

The level of four kind of inventory depends upon the nature of the business. Supplies include office and cleaning materials like soap, brooms, oil, light, blubs etc. these materials do not directly enter production, but are necessary for production process.

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NEED OR INVENTORY CONTROL

Transaction motive:

Every firm has to maintain some level of inventory to meet the day-to-day requirement of sales, production process, customer demand etc. In the finished goods as well as raw material are kept as inventories for smooth production process of the firm.

Precautionary motive:

A firm should keep some inventory for unforeseen circumstances also like loss due to natural calamities in a particular area, strikes, lay outs etc so the firm must have some finished goods as well as raw-materials to meet circumstances.

Speculative motive:

The firm may be made to keep some inventory in order to capitalize an opportunity to make profit due to price fluctuations.

BASIC REASONS TO KEEPING AN INVENTORY:

There are three basic reasons for keeping an inventory:

1. TIME: The time lags present in the supply chain, from supplier to user at every stage, requires that you maintain certain amount of inventory to use in this "lead time".

2. UNCERTAINTY: Inventories are maintained as buffers to meet uncertainties in demand, supply and movement of goods.

3. ECONOMIES OF SCALE: Ideal condition of "one unit at a time at a place where user needs it, when he needs it "principle tends to incur lots of costs in terms of logistics. So bulk buying, movement and storing brings.

INVENTORY MANAGEMENT

Inventory management is primarily about specifying the size and placement of stocked goods.

Inventory management is required at differ locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods. The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, feature inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecast.

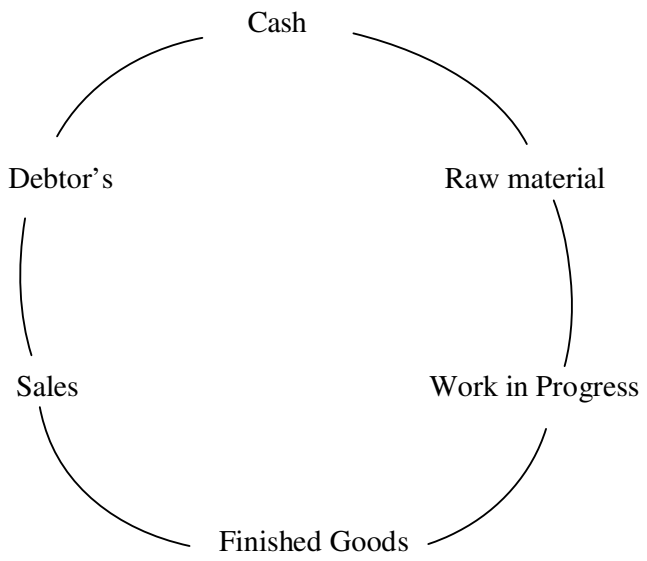
Inventory management involves:

- Inventory management is the active control program which allows the management of sales purchases and payment.
- System and processes that identify inventory requirements, set targets, provide replenishment techniques and report actual and projected inventory status.
- Inventory management helps providing a good understanding ground and the capacity to control financial costs.
- The Inventory management will control operating costs and provide better understanding.

OPERATING CYCLE OF INVENTORY MANAGEMENT

Operating Cycle is the time duration to convert sales after the conversion of resources into invention, into sales there is difference between current assets and fixed assets. A firm required many years to recover initial invests in fixed assets such plant and machinery or land buildings or furniture and fixtures etc. On the contrary, investment in current assets such as inventory and books debts are realized during the firms operating cycle, which in usually less than a year.

The operation cycle can be said to be the heart of the working capital. The need for working capital or current assets cannot be over emphasized as already observed. The main motive of many business firms is to achieve maximum profits, which can be earned depending upon the magnitude of the sales among other things. However, sales do not convert in to cash instantly. There is invariable time lag between sale of goods and receipts of cash. Therefore the need of working capital in the form of current assets to deal with the problem arising good sold. Therefore, sufficient working capital requires sustaining sales activity. Technically this is refer to as the operating the cash cycle. The continuous flow form cash to supplies to inventory to accounts receivable and back into cash what is called operating cycle.



The operating cycle of manufacturing company has three phases namely

1. Acquisition of resources
2. Manufacturing products
3. Sale of product

Acquisition of resources:-

In the phase first operating cycle, include phases of raw materials, fuel & power etc., which are totally required or manufacturing product

Manufacturing products:-

In the phase 2 of the operating cycle includes conversion of raw material in to work-in-progress and the work in progress is converted into finished goods.

Sale of product:-

In the phase 3 of the operating cycle may sale the product either for credit is made to customers**.**

REASONS AND BENFITS OF INVENTORY:

The optimal level to maintaining inventory is subjective matter and depends upon the features of a particular firm.

Trading firm

In case of a trading firm there may be several reasons for holding inventories because of sales activities that should not be interrupted more over it not always possible to procure the good whenever there is a sales opportunity there is always a time gap required between purchase and sale of goods. Thus trading concern should have some stock of finished goods in order to under-take sales activities independent of the procurement schedule.

Similarly, a firm may have several incentives being offered in terms of quantity discounts or lower price etc by the supplier of goods. There is trading concern inventory helps in a de-inking between sales activity and also to capitalize a profit of opportunity due to purchase make at a discount will result in lowering the total cast resulting in higher profits for the firm

Manufacturing firm

A manufacturing firm should have inventory or not only the finished goods, but also of raw materials and work -in-progress for following reasons.

Uninterrupted production schedule

Every manufacturing firm must have sufficient stock of raw materials in order to have the regular and uninterrupted production schedule. If there is stock out of raw materials in order to have the regular and uninterrupted production schedule. If there is stock out of raw material at any stage of production process then the whole production may come to a half. This may result in custom dissatisfaction as the goods cannot be delivered in time more over the fixed cost will continue to be incurred even if there is no production.

Further work-in-progress would let the production process run smooth. In most of manufacturing concerns the work in progress is a natural outcome of the production schedule and it also helps in fulfilling when some sales orders, even if the supply of raw-materials have stopped.

ESSENTIALS OF INVENTORY CONTROL

The important requirements of inventory control are:

- A firm needs inventory control system to effectively manage its inventory.
- Proper classification of materials with codes, material standardization and simplification.
- The operation of a system of internal check to ensure that all transactions involving material and equipment are checked by properly authorized and independent persons.
- The operation of a system of perpetual inventory so that it is possible to determine at any time, the amount and value of each kind o material in stock.
- A suitable method of valuation of materials is essential because it affects the cost of jobs and the value of closing stock of materials.

Objectives of Inventory Control

The main objectives of inventory control are:

1. To maintain a large size of inventory for efficient and smooth production and sales operation.

2. To maintain a minimum investment in inventories to maximize profitability.

3. To ensure a continuous supply of raw materials to facilities uninterrupted production.

4. To maintain sufficient stocks of raw materials in periods of short supply and anticipate price change.

5. Maintain sufficient finished goods inventory for smooth sales operation and efficient customer services.

6. Minimize the carrying cost and time.

7. Control investment in inventories and keep it at an optimum level.

Advantages of Inventory Control

The following are suggested advantages:

1. Eliminates wastages in use of material.

2. It reduces the risk of loss form fraud and theft.

3. It helps in keeping perpetual inventory and other records to facilitate the preparation of accurate material reports management.

4. To reduce the capital tied up in inventories.

5. It reduces cost of storage.

Disadvantages of Inventory Control

Every firm has to maintain optimal level of inventories. It not the following will be the result in form of losses.

1. **Opportunity cost** : Every firm has to maintain inventory for that some investment is needed it is known as opportunity cost and handle the investment in inventory are more the funds are blocks up with inventory.

2. **Excessive inventories**: It will lead to firm losses due to excessive carrying costs the risk of liquidity. It is also referred as danger level.

3. **Inadequate Inventory**: It is another danger which results is production hols-up and failure to meet delivery commitments. In adequate raw materials and work - in - process inventors will results in frequent production interruptions. It finished goods are not sufficient customers may shifts to competitors.

4. **Danger due to physical decoration**: It is one of the reason with the inventories due to maintaining stocks at high levels they will be deteriorated due to passage of time, sometimes due to mishandling or improper storage facilities.

Costs involved in Inventory

Every firms maintains inventory depending upon requirement and other features of firm for holding such inventory some cost will be incurred there are as follows .

Carrying Cost

This is the cost incurred in keeping or maintaining an inventory of one unit of raw materials, work-in-process or finished goods. Here there are two basic cost involved.

Cost of Storage

It includes cost of storing one unit or raw materials by the firm. This cost may be for the storage of materials. Like rent of spaces occupies by stock, stock for security, cost of infrastructure, cost of insurance, and cost of pilferage, warehousing costs, handling cost etc.

Cost of Financing

This cost includes the cost of funds invested in the inventories. It includes the required rate of return on the investments in inventory in addition to storage cost etc. The carrying cost include therefore both real cost and opportunity cost associated with the funds invested in the inventories.

The total carrying cost is entirely variable and rise in directly proportion to the level of inventories carried.

Total carrying cost = (carrying cost per unit) X (Average inventory)

Cost of Ordering

The cost of ordering includes the cost of acquisition if inventories.
It is the cost of preparation and execution of an order including cost of paper work and communicating with the supplier.

The total ordering cost is inversely proportion to annual inventory of firm. The ordering cost may have a fixed component, which is not affected by the order size: and a variable component, which changes with the order size.

Total Ordering Cost = (No of orders) X (cost per order).

Cost of Stock out

It is also called as hidden cost. The stock out is the situation when the firm is not having units of an item is stores but there is a demand for that item either for the customers or the production department. The stock out refers to zero level inventories. So there is a cost of stock out in the sense that the firm faces a situation of lost sales or back orders. The stock outs are quite often expensive.

Even the good will of firm also be effected due to customers dissatisfaction and may lose business in case of finished goods, where as in raw materials or work in process can cause the

Production process to stop and it is expensive because employees will be paid for the time not spine in producing goods.

The carrying cost and the ordering cost are opposite forces and collectively. They determine the level of inventors in a firm.

Total Cost = (Cost of items purchased) + (Total Carrying and ordering cost)

Valuation of Inventory

The methods of valuing inventory are combination of the actual cost and replacement cost plans. The chief advantage of the cost or net realizable value rule is that it is conservative. Hence the methods of valuation of inventory are quite independent of system of mincing.

In balance sheet closing stock is shown under current assets and it also credited to manufacturing or trading accounts. The inventories are valued on the basis as follows:

I) Cost of raw materials in stock may include freight charges and carrying cost. But such cost should not exceed market price.

II) **Work** - in - process is generally valued at cost, which includes cost of materials, labor. And the proportionate factory overhead, as it is reasonable according to degrees of completion.

III) Cost of finished goods wound normally to the total or full cost it includes prime cost plus appropriate amount of the overhead. Selling and distribution cost is deducted on the other hand work in progress may be valued at work in progress may be valued at work cost, marginal cost, prime cost or , even at direct materials.

Purchase & stores procedure

In inventory management the purchase department store department plays a major role to be the effective inventory there must be cooperation of various departments such as purchase receiving and inspection stores production and stock control departments.

The main functions of each department are as follows:

Purchase Department

It is responsible for purchase of all necessary goods of proper quality to produces, without interruption to supply the finished goods.

1) It receives purchase requisitions.
2) Invites quotations or tenders from suppliers with desired quality.
3) Issue purchase orders to the selected supplier.
4) Certify the quality and quantity of order received in specified time
5) Approve purchase invoice for payment after checking invoice for paying after checking prices and extensions if any needed.

Material Cost

Materials cost of a job or cost unit can be ascertained by multiplying the quantity consumed for the job or cost unit by the price of the materials. For ascertaining the quantity consumed for each job or cost unit we have devised material requisition which will indicate the quantity required for the job and the job number against which the material cost will be change directly.

For indirect material issued the material requisition will not indicate the job number but the cost center number will be indicated for charging to relevant cost center as indirect materials.

Thus in order to ascertain material cost.

1. Make valuation of purchase.
2. Make use of proper valuation of material issue and closing stock following different method such as, FIFO, LIFO WEIGHTED AVG. Etc.

The purchase price of material is directly obtained from the suppliers receives and have to be issued to production before the invoice of materials is received.

The rate per unit, total price of the item as shown in the purchase order plus sundry charges such as delivery and forwarding charges sales tax, duty etc, may be borne by suppliers, governments controlled prices by notifications, suppliers, catalogues and circulars may be valuable guides for obtaining rates of materials.

Delivery charges may be estimated with reference to the kind of transport with charges incurred. The price may also include sales tax, excise duty, fright etc, so the total cost and rate per unit can be computed and entered in the stores received registered and posted to stores ledger for the issue of material to production.

In some cases material needs adjustment for any discount allowed charges for transport containers etc.

Discounts may be like trade discounts quantity discount, cash discounts etc. Transportation and storage costs may not include the cost of air, sea on land transport and other stores costs, where the purchaser has to bear the costs. Cost of containers with regarded may not make a separate charge because of non refundable and also sales tax, excise duty, insurance etc., all the items are added to
Purchase price.

Receiving and Inspection Department

a) Receiving all raw materials and other supplies from various suppliers.

b) Verify items by count, weight etc., and report any shortage

c) Inspect materials and supplied as to quality by analyzing them suitably.

d) Inform the purchasing department and accounts department all facts that may require adjustment with vendor.

e) Analyze and give them the code depending up on the type of materials.

Stores keeping Department

a) Check and accept all materials form the received department.

b) Identity each material received with the stock list, check the code number and place in the respective bins.

c) Issue materials and supplies for use upon presentation of authorized requirement.

d) Record quantities received and issued on bin lards or stock ledger cards consisting the perpetual inventory records.

Production Department

Make out materials requirement note i.e. requisition of requisite quantity and quality of materials at the right moment so the all materials may be available without delay on production.

1) Check and verify that the materials of requisite quantity and quality have been received and charged to production.

2) Keep proper records or materials received and their progress through different operations or progress.

3) Prepare materials return note for excess materials.

4) Prepare materials transfer note to cover any transfer of materials.

5) Prepare report on scrap for reporting to management.

Inventory Control Department

In may be a subdivision of the cost accounting department, although in many concerns, it is a part of the stores keeping department.

A) It keeps perpetual inventory records.
B) Adjust the stock on receipt of the property authorized adjustment notes.
C) Prepare weekly or monthly, statement of receipts, issue, balance and average consumption of materials both in terms of quantity and value.

RECEIPT AND ISSUE OF INVENTORIES:

(a) Receipt Inventories in to store:

After incoming materials have been examined and approved they are passed on to the appropriate stores together with the goods received note. Articles are inspected and passed and on the stores in the usual way. In order to keep the accounting procedure uniform, it is desirable that a goods received note be prepared for these articles also, the store keeper than places the inventory in appropriate bin or shelf and make necessary entries in the receipt column of the Bin Card.

A location code for materials helps in proper store - keeping with greater efficiency, because stores can be easily identified. It is a part and parcel of stock control procedure. Location code helps in mechanized accounting and safeguard against omission in counting as verification.

BIN CARD

DESCRIPTION:
MATERIAL CODE:
LOCATION CODE:
BIN NO:
STORES LEDGER NO:

MAXIMUM LEVEL:
MINIMUM LEVE:
ORDERING LEVE:
ORDERING QUANTITY:
UNITS:

RECEIPTS			**ISSUES**			**BALANCE**	**AUDIT**
Date	Goods received Note No.	Qty (units)	Date	Requisition Note No.	Qty (units)	Qty (units)	Initial & Date

BIN CARD

For each kind of materials or article a Bin Card attached to the bin which each individual's materials is stored. A bin card provides a running record of receipts, issues and stock in the simplest form. An entry will be made at the time of each receipt or issue and new balance will be extended.

These cards should agree with the quantities entered in the relevant accounts in the stores ledge. The main advantage is to enable the stores keeper to ascertain at a glance the quantity of materials in stock and remind him to place purchase requisition for further suppliers the ordering level has been reached more over they provide on independent check on stores ledger and anciently a second perpetual inventory. If the bin card is from three years then the transactions are made in same card. If Bin Card does not exist new Bin Card to be opened.

Issue of Material from Stores

The storekeeper issue materials on receipt of proper authorized document usually called a materials requisition or a specification of material. Material requisition is a document which authorities and records the issue of materials for use.

The materials requisition details the items required for the showing the quantity, description, and code or past number and the cost center of job to be charged. Requisition is normally prepared in triplicate: the department receiving the goods retains one copy and the other two copies are handed over to the two copies are handed over to the storekeeper. He keeps one along with him and enters on the issue sides of the appropriate bin card day – today transactions are noted in stores ledger. Stores ledger:

The stores ledger which is usually a loose leaf or card type , contains an account for each class of materials their ledger is kept in the cost department and contains such information as well facilitate the ascertainment of all details relating to the materials in the minimum of time.

STORES LEDGER ACCOUNT

FORM NO: FOLIO:

MATERIALS: MAXIMUM LEVEL:

GRADE: MINIMUM LEVEL:

UNITS: ORDERING LEVEL:

CODE NO: ORDERING LEVEL;

LOCATION

Date	**CSRV/STDNO. MIR NO.**	**Production Order No./Section**	**Receipts &Issue**		
			Quantity		
			In	Out	Balance

Materials returned to Stores

Where materials are issued in excess of requirement the excess quantity is return to the stories together with materials return note.

Since the materials return to store form a works order is a reduction in the amount recorded as issued, the preferable entry is to enter the number of units and the value of materials returned and received in a different work in the issue column of the stores ledger account.

These values are deducted from total issues, and amount returned by each department as shown by materials return note is deducted where return of materials to stores return of material to stores is a major problem it is customary to use a materials and supplies journal for keeping records of items.

MATERIAL RETURN NOTE

FROM: NO:

DEPARTMENT: DATE:

JOB NO:

ORDER NO:

Qty.	**Description**	**Code No.**	**Office Use only**		**Remarks**
			Rate	**Amount**	
Approved by	**Returned by**	**Returned by**	**Bin NO. Stores ledger Follow No.**	**Cost officer Ref. No.**	**Priced by**

MATERIAL TRANSFER NOTE

NO: DATE:
FROM: TO:
DEPARTMENT: DEPARTMENT:
JOB NO: JOB NO:
ORDER NO: ORDER NO:

Qut.	Description	Code No.	Office use only		Remarks
			Rate	Amount	
Approved by	Issued	Received by	Cost Ref. No.	Officer	Priced by

Transfer of materials

Transfer of materials form one job to another is prohibited unless the detail is adequately recorded on the materials Transfer note. Such transfer is permissible only where an urgent order has to be made and work started on a less urgent order may be appropriates. Such a note shows are incessancy date for ordering and debiting the cost accounts affected. These not are passed direct to the cost office for the appropriate adjustment in the work - in -progress ledger.

All these four notes including stores ledger and bin card are major for inventory management which are valued and checked for every quarterly of half yearly or annual

Valuation of Materials Issues

The fixation of the price at which the materials are issued are to be charged to production is an important one from the point of view to inventory management. These are numerous factors to be taken into amount in pricing the material they are.

a) The nature of the business and type of production. The frequency of purchase price fluctuations and issues of materials.

b) Rang of price fluctuation and value of material issued and size of bath of materials issued.

c) Requirement that purchasing efficiency should be revealed or not.

d) The accuracy with which issues can be computed.

e) The durability of stock i.e. whether it evaporates absorbs moisture or deteriorates quickly.
f) The length of inventory turnover period and quantity of material to be handled with the necessity for maintaining uniformity within an industry.

ISSUE PRICING METHODS

There are two categories

(I) Cost prices :

(a)FIFO (First in First out)
(b)LIFO (Last in first out)
(c)Specific price
(d)Base stock price
(e)HIFO (highest in first out)

(II) Delivered from cost prices

(a) Simple average price
(b) Weighted average price
(c) Periodic simple average price
(d) Periodic weighted average price
(e) Moving simple average price
(f) Moving weighted average price

(III) Notional prices

(a) Standard price
(b) Inflated price
(c) Re- use price
(d) Replacement price

First in First out (FIFO)

This is the price paid for the material first taken into stock from which the material to be priced could have been drawn.

Under this method stocks of materials may not be used up in chronological order but for pricing purpose it is assumed that items longest in stocks are used up first. The method is most suitable for use where in material is slow - moving and comparatively high unit cost.

Advantages:

(I) Price is based on actual cost and not on basis of approximations such as no profits or losses arises by reasons of adopting this method.

(II) The resulting stock balance generally represents fair commercial valuation of stock.

(III) It is based on traditional principles.

Disadvantages:

(I) The number of calculations in the stores ledger involved tends to be Complicated with increase in clerical error.

(II) The cost of consecutive similar jobs will differ if the price changes Suddenly.

(III) In times of rising prices, the charge to production is unduly low as the Cost of replacing the material will be higher.

Last in first out (LIFO)

This is the price paid for the material last taken into stock from which the materials to be priced could have been drawn. This method also ensure material being issued at the actual cost. Its use is based on the principle that costs should be as closely as possible related to current price level. Under this method production cost is calculated on basis on replacement cost.

Advantages

(I) Production is charged at the most recent prices so that it is based on the principle that cost should be related to current price levels.

(II) It obviates the necessity for continuously ascertaining the replacement price.

(III) Neither profit nor loss is usually made by using this method.

(IV) In the times of rising prices there is no wind fall profit as would have been obtained under FIFO.

Disadvantages

(I) Needs more clerical work.
(II) Compassion among similar jobs is very difficult.
(III) Stock values relating to prices of the oldest cost on hand may be entirely out of the current replacement prices.

Weighted average price

This is the price which is calculated by Z dividing the total cost of material in the stock from which the material to be priced have been drawn, by the total quantity of material in the stock. This method differs from all other methods because here issue prices are calculated on receipts of materials and not on issue of materials. Thus as soon as new lot is received a new price is calculated and issues are then taken.

Advantages

(I) this method is advantageous where the price varies widely as its use even out the effect of these wide variations.

(II) The basis of price calculations is a simple one involving only the division of total amount of material in stock by quantity in stock.

(III) Calculation of new prices arises only when receipt of stocks are received.

(IV) Stock records under this method give a fair indication of the stock values, which can be used in financial analysis.

Disadvantages

This method is completed than simple average because it takes into consideration the total quantities and total costs in stock.

(I) Profit or loss may be incurred as in simple average price.

(II) As LIFO or FIFO this method calls for many calculations.

(III) In order to calculate the accurate value of issues the average price must normally be calculated to four to five decimal places.

Standard price

It is the predetermination of fixed price on basis of a specification of all factors affecting price like the quantity of materials in hand and to be normally purchased and rate of discount compared with existing price including or excluding freight and ware housing expense.

A standard price for each material is set and the actual price paid is compared with standard. It is paid exceeds the standard a loss will be realized if not profit will be obtained.

Advantages

(I) This method is easy to operate.

(II) Comparing the actual prices with the standard price will determine the efficiency of purchase department.

(III) The effect of price variations is eliminated from job costs.

(IV) It reduces classical costs be eliminating detailed cost records.

(V) In times of inflation or price fluctuations is very difficult to fix a standard price.

(VI) This method also incurs a profit or loss on issues and closing stock.

Inflated price

This is the price, which includes a charge designed to cover the cost of contingencies or related costs.

This price include not only the cost involved in bringing the material to the purchase premises but also the loss due to evaporation and breakage etc, as well as carrying costs. Increased gradually every year from 2002 to 2005.

ARTICLE

ARTICLE -1

Title: A review of inventory management research in major logistics journals: Themes and future directions

Author(s): Brent D. Williams, (Department of Marketing and Logistics, Sam M. Walton College of Business, University of Arkansas, Fayetteville, Arkansas, USA), Travis Tokar, (The Ohio State University, Fisher College of Business, Marketing and Logistics, Columbus, Ohio, USA)

Citation: Brent D. Williams, Travis Tokar, (2008) "A review of inventory management research in major logistics journals: Themes and future directions", International Journal of Logistics Management, The, Vol. 19 Iss: 2, pp.212 - 232

Keywords: Inventory management, Research, Supply chain management

Article type: Literature review

DOI: 10.1108/09574090810895960 (Permanent URL)

Publisher: Emerald Group Publishing Limited

Abstract: *Purpose* – The purpose of this paper is to provide a review of inventory management articles published in major logistics outlets, identify themes from the literature and provide future direction for inventory management research to be published in logistics journals.

Design/methodology/approach – Articles published in major logistics articles, beginning in 1976, which contribute to the inventory management literature are reviewed and cataloged. The articles are segmented based on major themes extracted from the literature as well as key assumptions made by the particular inventory management model.

Findings – Two major themes are found to emerge from logistics research focused on inventory management. First, logistics researchers have focused considerable attention on integrating traditional logistics decisions, such as transportation and warehousing, with inventory management decisions, using traditional inventory control models. Second, logistics researchers have more recently focused on examining inventory management through collaborative models.

Originality/value – This paper catalogs the inventory management articles published in the major logistics journals facilitates the awareness and appreciation of such work, and stands to guide future inventory management research by highlighting gaps and unexplored topics in the extant literature.

ARTICLE -2

Title: Risk Aversion in Inventory Management

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Citation: Subject classification: inventory/production: policies, uncertainty; decision analysis.

Keywords: Inventory management, Research, RManufacturing, Service , and Service, and Supply chain operations.

Article type: Literature review

Publisher: Online in Articles in Advance September 14, 2007.

Abstract: Purpose – Traditional inventory models focus on risk-neutral decision makers, i.e., characterizing replenishment strategies that maximize expected total profit, or equivalently, minimize expected total cost over a planning horizon. In this paper, we propose a framework for incorporating risk aversion in multi-period inventory models as well as multi-period models that coordinate inventory and pricing strategies. We show that the structure of the optimal policy for a decision maker with exponential utility functions is almost identical to the structure of the optimal risk-neutral inventory (and pricing) policies. These structural results are extended to models in which the decision maker has access to a (partially) complete financial market and can hedge its operational risk through trading financial securities. Computational results demonstrate that the optimal policy is relatively insensitive to small changes in the decision-makers level of risk aversion.

Traditional inventory models focus on characterizing replenishment policies so as to maximize the expected total profit, or equivalently, to minimize the expected total cost Over a planning horizon. Of course, this focus on optimizing expected profit or cost is appropriate for risk-neutral decision makers, i.e., inventory planners that are insensitive to profit variations.

ARTICLE -3

Title: Purchasing and Inventory Management

Author(s): Charles Dominick
DPurchTips – Edition # 116 December 27

Citation: //Subject classification: inventory/production: policies, uncertainty; decision analysis.

Keywords: Inventory management, Research, Purchasing.

Article type: Literature review

Abstract: Purpose – First, you must know how much inventory to have on hand to ensure continuity of supply in the event of an uncharacteristic increase in either demand and/or lead time. This quantity of inventory is called the safety stock. There is no universally used formula for determining safety stock quantity, but PurchTipsS Edition 86 suggested a risk averse calculation.

Second, you must know when to reorder materials for inventory. Generally, this point in time is determined when the quantity of materials in stock decreases to a certain level, called the reorder point. The reorder point is determined by the formula:

ROP = SSQ + (QUD x ALT)

Where,

ROP = Reorder Point

SSQ = Safety Stock Quantity

QUD = Quantity Used Daily

ALT = Average Lead Time (in days)

Third, you must know how much to order. A complex mathematical equation determines the Economic Order Quantity, or EOQ. The equation recognizes the tug of war between acquisition costs and inventory carrying costs: when you order bigger quantities less frequently, your aggregate acquisition costs are low but your inventory costs are high due to higher inventory levels. Conversely, when you order smaller quantities more often, your inventory costs are low but your acquisition costs are higher because you are expending more resources on ordering. The EOQ is the order quantity that minimizes the sum of these two costs.

Fortunately, inventory management systems calculate the EOQ for you. But if you want to see the EOQ equation, check out my blog post entitled Purchasing and Inventory Management.

CHAPTER-IV
DATA ANALYSIS

DATA ANALYSIS

Technique of Inventory Management:

Main problems in inventory management are to answer:

- What are Indus problems in managing inventories?
- Which inventory policy optimum for Indus? Why? Show calculations.
- What should be the over level?

To answer these following techniques are used:

* **ABC analysis**
* **Economic Order Quantity**
* **VED Analysis**
* **Re-Order Level**
* **Safety stock**
* **Inventory Turnover Ratio**

ABC Analysis

* It is based on proposition that
* Managerial items and efforts are scare and limited.
* Some items of inventory are some important than others.

ABC Analysis

ABC analysis classifies various inventory into three sets or groups of priority the allocates managerial efforts in proportion of
The priority the most important item are classified into class - A,
Those of intermediate importance are classified as "class - B'' and remaining items are classified into class - C'.

The financial manager has to monitor the items belonging to monitor the items belonging to different groups in that order of priority and depending upon the consumptions.

The items with the highest values is given priority and soon and are more controlled then low value item. The re - rational limits are as follows.

Category	% of items	% of total cost of materials
A	5 - 10	70 - 85
B	10 - 20	10 - 20
C	70 - 85	5 - 10

Procedure

(I) Items with the highest value is given top priority and soon.

(II) There after cumulative totals of annual value consumption are
Expressed as percentage of total value of consumption.

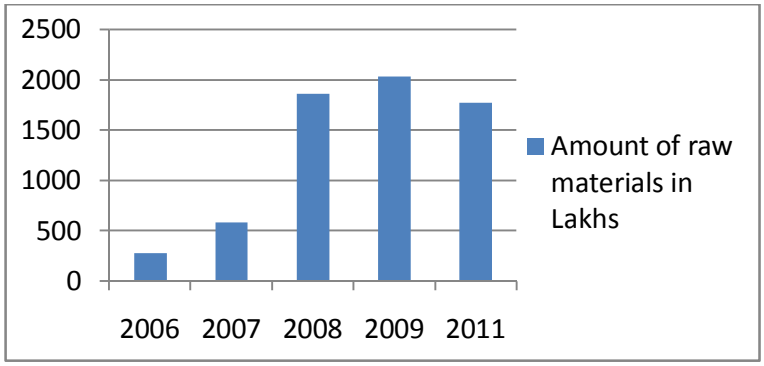
(III)Then these percentage values are divided into three categories.

ABC analysis helps in allocating managerial efforts in proportion to importance of various items of inventory.

ABC Analysis

Raw material (at closing stock)

YEAR	AMOUNT OF RAW MATERIALS
2006	274.94
2007	582.11
2008	1858.17
2009	2031.85
2011	1768.52

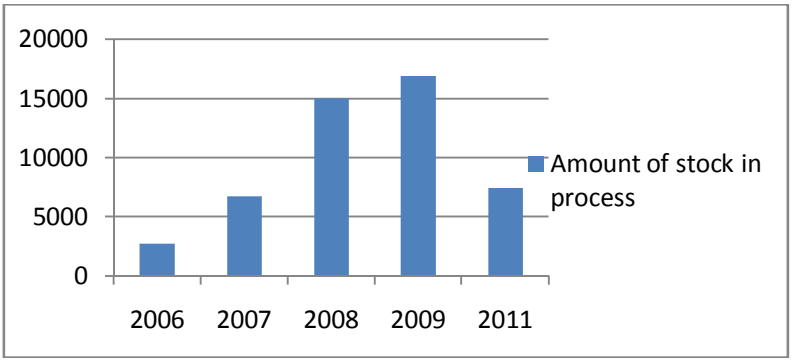


Interpretation:

The above graph shows the amount of raw materials at cost. In 2006 the cost of material is 274.94 rs increased in this year and in 2007-2008.It is more increased to 1858.17rs and in 2009 it is increased to rs2031.85 and in 2011 it is decreased to 1768.52.

Stock in process (at closing stock):-

YEAR	AMOUNT OF STOCK in PROCESS
2006	2006.20
2007	82.67
2008	122.82
2009	110.96
2011	NILL

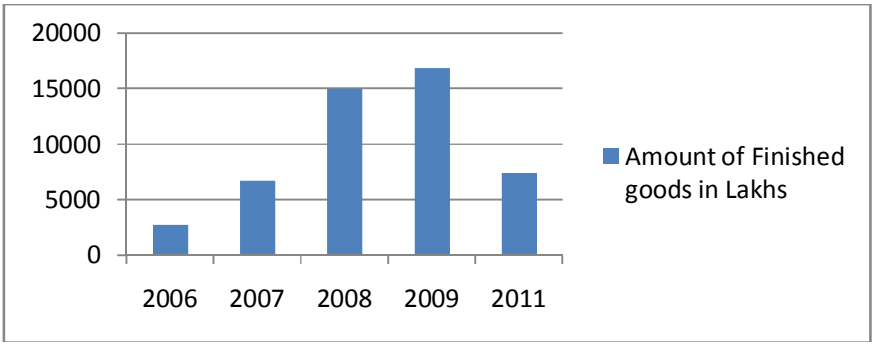


Interpretation:

The above graph shows that work in progress at cost. In 2006 the cost of material is 2006.20 rs increased in this year and in 2007 it is decreased to rs 82.67 in the year 2008 it is increased to 122.82and it is also maintained in the year 2009 and in 2011 it is nill.

Finished goods (**at closing stock**):-

YEAR	AMOUNT OFFINISHED GOODS
2006	2704.08
2007	6717.44
2008	15019.79
2009	16880.69
2011	7443.66

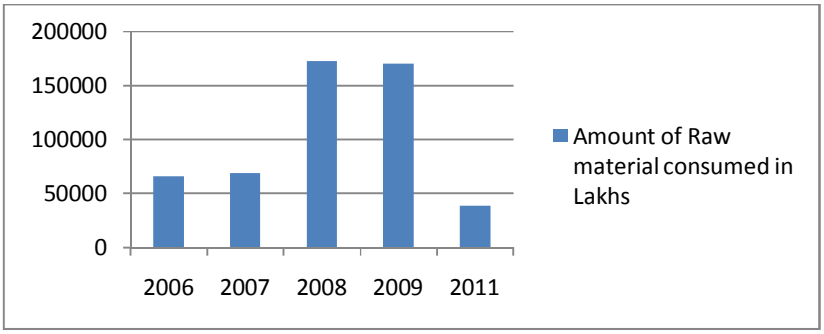


Interpretation:

The above graph shows the amount of finished goods at cost. In 2006 the cost of material is 2704.08 rs.It is increased to rs6717.44 in the year 2007..It is increased in the year 2008-09 the cost of goods is rs 1,6880.69 and in the year 2011 it is decreased to 7443.66.

Stores, spares & consumables (closing stock):-

YEAR	AMOUNT OF COST OF STORES AND SPARES
2006	673.25
2007	1628.44
2008	3617.38
2009	3539.05
2011	973.02

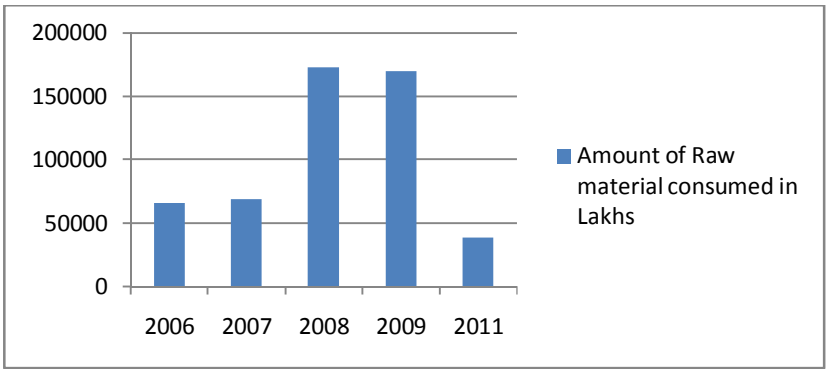


Interpretation:

The above graph shows the amount of stores and spares at cost. In 2006 the consumable is rs 673.25 and it is highly increased to rs 1628.44 in the year 2007.The form maintains goods in proper way rs 3617.38 in the year 2008 and it is decreased to rs 3539.05 in the year 2009 and in the year 2011 it is decreased to 973.02.

Raw material consumed:-

YEAR	AMOUNT
2006	65875.45
2007	68699.73
2008	172305.70
2009	16,9697.36
2011	38607.65



Interpretation:

The above graph shows consumption of raw materials .The consumption of raw material in the year 2006 is rs 65875.45 the consumption of raw material increased in the year 2007-08 in the rs 172305.70. And it is decreased to Rs 16,969,736,368 in the year 2009 and it decreased to Rs 3, 8607.65 in the year 2011.ss

Economic order quantity:

During 2006-2007:

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2006-2007.

PARTICULARS	
Billets/Blooms	28,889 Qty (mt)
Ordering cost per order	Rs. 2000
Carrying cost	10%
Purchase price per unit	400

1. Calculation of EOQ:-

Total units required (A) =28889

The ordering cost per order (O) = Rs.2000

Carrying cost per unit (C) = 10%

(i.e.) 10% of Rs.400 =Rs.40

EOQ $= \sqrt{2AO/C}$

$=2*28889* 2000/40$

=Rs.1699.67

2. Number of orders for the year = A/EOQ

=2889/1699.67

=16.99~17orders

3. **Total annual cost = carrying cost + ordering cost**

= 1445000+ 34000

= Rs.1479000

- **Carrying cost =** order size ***** average inventory
  - **order size =** A/no of orders

    =28889/17

    = 1699.67
  - **Average inventory** = order size/2
    =1700/2
    = Rs.850
  - **Carrying cost** = 1700*S850

    = Rs.1445000
  - **Ordering cost =** cost per order * no of orders

    = 2000*17

    =Rs.34000

EOQ DURING 2007-2008

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2007-2008.

PARTICULARS	
Billets/Blooms	123596Qty (Mt)
Ordering cost per order	2200
Carrying cost	10%
Purchase price per unit	Rs 420

1. Calculation of EOQ:-

Total units required (A) =123596mt

The ordering cost per order (O) = Rs.2200

Carrying cost per unit (C) = 10%

(i.e.) 10% of Rs.2000 =Rs.42

EOQ = √2AO/C

= 2*123596*2200/42

= Rs.3598.354

2. **Number of orders for the year** = A/EOQ
= 123596/3598.354
= 34.79~35orders

3. **Total annual cost** = carrying cost + ordering cost
= 6245669+ 77000
= Rs.6322669

- **Carrying cost = order size average inventory**
    - **order size = A/no of orders**

      = 123596/35

      = 3531.31
    - **Average inventory = order size/2**

      = 3531.1/2

      = Rs.1768.655
    - **Carrying cost =** 3531.31*1768.655

      = Rs.6245669
    - **Ordering cost = cost per order no of orders**

      = 2200 *35

      = Rs.77000

EOQ DURING 2008-2009

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2008-2009.

PARTICULARS	
Billets/Blooms	106,066,Qty (Mt)
Ordering cost per order	Rs 2400
Carrying cost	10%
Purchase price per unit	Rs 440

Calculation of EOQ:-

Total units required (A) =106066mt

The ordering cost per order (O) = Rs.2400

Carrying cost per unit (C) = 10%

(i.e.) 10% of Rs.2000 =Rs.44

EOQ $=\sqrt{2AO/C}$

$=2 *106066* 2400/44$
=Rs.3401.59

Number of orders for the year = A/EOQ

=106066/3401.59

=31.18~32orders

Total annual cost = carrying cost + ordering cost

= 5.493154+ 76800

= Rs.5569954

- **Carrying cost = order size * average inventory**

- **Order size = A/no of orders**

  = 106066/33/2
  = 3314.56

- **Average inventory = order size/2**
  = 3314.56/2
  = Rs.1657.28

- **Carrying cost** = 3314.56*1657.28
  = Rs.5493154

- **Ordering cost = cost per order * no of orders**
  = 2400*32
  = Rs.76800

EOQ DURING 2009-2011

The firm requires below given units of material for manufacturing of steel. The following are the details of their operation during 2009-2011.

PARTICULARS	
Billets/Blooms	184,661
Ordering cost per order	3000
Carrying cost	12%
Purchase price per unit	Rs 500

Calculation of EOQ:-

Total units required (A) =184,661mt

The ordering cost per order (O) = Rs.3000

Carrying cost per unit (C) = 12%

(i.e.) 12% of Rs.500 =Rs.50

EOQ $=\sqrt{2AO/C}$
$=$ 2*184,661*3000/50
$=$ Rs.4, 707.37

Number of orders for the year = A/EOQ
= 184661/4707.37
= 39.23~39 orders

Total annual cost = carrying cost + ordering cost
= 11209639+ 117000
= Rs.11326639.

- **Carrying cost = order size* average inventory**

  - **Order size = A/no of orders**

    = 184661/39
    = 4734.90

  - **Average inventory = order size/2**

    = 4734.90/2

    = Rs.2367.45

  - **Carrying cost = 4734.90 *2367.45**

    = Rs.11209639

  - **Ordering cost = cost per order* no of orders**

    = 3000* 39

    = Rs.117000

VED ANALYSIS

Vital Essential and Desirable analysis is done mainly for control of spare parts keeping in view of the criticality to production.

Vital spares are spare the stock – out of which even for a short time will stop production for quite some time. Essential spares are spares the absence of which cannot be tolerated for more than a few hours a day. Desirable spare are those, which are needed, but their absence for even a week or so will lead to stoppage of production.

MATERIAL	CLASS	VALUE	PRIORITY		MATERIAL
10%	"A"	70%	V	10%	70%
			E	20%	10%
			D	70%	10%
20%	"B"	20%	V	10%	70%
			E	20%	20%
			D	70%	10%
70%	"C"	10%	V	10%	70%
			E	20%	20%
			D	70%	10%

THE RE-ORDER LEVEL

The re-order level is the level of inventory at which the fresh order for that item must be placed to procure fresh supply. The re-order level depends upon.

1. Length of time between the placement of an order and receiving the supply.
2. The usage rate of the item. The inventory is constantly being used up. The rate at which the inventory is being used up. The rate at which the inventory is being used up is called the usage rate.

The reorder level can be determined as follows:

R= M+TU
R=Reorder level
M=Minimum level of inventory
T=time gap/delivery time
U=Usage Rate

The reorder level and inventory patterns have be shown as follows:

The figure shows that if the usage rate is constant, the order are made at even intervals for the same amounts each time and the inventory goes to zero just before an order is received.

Safety stock:

The safety stock protects firm from tradeoffs due to unanticipated demand for the items level of inventory investments is however increased by the amount of safety stock. Safety level is ascertained in inventory as a part because there is always an uncertainly involved in time lag usage rate or other factors.

Usually smaller the safety level greater the risk of stock – outs. If stock levels are predictable then there is a chance of stock out occurring. However stock inflows and outflows are unpredictable or lesser predictable it becomes to carry additional safety to prevent unexpected stock outs so usage rate is estimated if cost is low then no safety stock is needed.

Just – In – Inventory:

The Basic concept is that every firm should keep a minimum level of inventory on hand, relying suppliers to furnish just in time as and when required. JIT helps in emphasizing sufficient level of stock to ensure that production will not be interrupted. Although the large inventories may be had idea due to heavy carrying JIT is a modern approach to inventory management and the goal is essentially to minimize such inventories and there by maximizing turnover.

JIT system significantly reduces inventory carrying cost be requiring that the raw material be procured just in time to be placed into production. Additionally the work in process inventory is minimized by eliminating inventory buffers between different production departments.

If JIT is to be implemented successfully there must be a high degree of coordination and co operation between the supplier and manufacturer and among different production centers. JIT does not appear to have any relation with EOQ however it is in fact alters some of the assumptions of EOQ model. The average inventory level under the EOQ model is defined as

Average inventory =1/2EOQ+safety level JIT attacks this equation in two ways.

- By reducing the order cost.
- By reducing the safety stock

The basic philosophy in JIT is that benefits, associated with reducing inventory and delivery time to a bare minimum through adjustment iEOQ model, will more than offset the costs associated with the increased possibility of stock – outs.

Inventory Turnover Ratio

What it is

This ratio is often a firm's inventory turns over during the course of the year. Because inventories are the least liquid form of assets, a high inventory turnover ratio is generally positive. On the other hand, and usually high ratio compared to the average for the industry could mean a business is losing sales because of inadequate stock on hand.

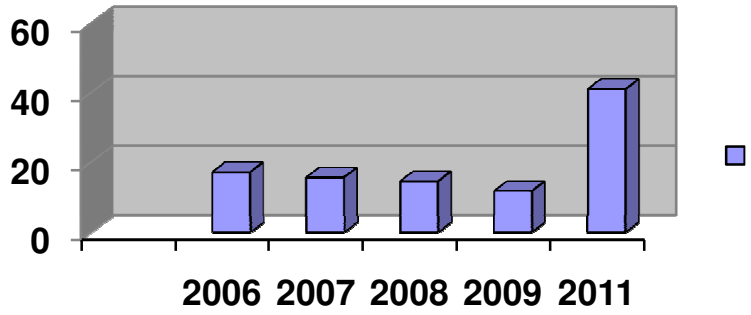
When to use it

If a firm's business has significant assets tied up in inventory, tracking its turnover is critical to successful planning. If inventory is turning too slowly, it could indicate that is may be hampering the firm's cash flow.
Because this ratio judge's annual inventory turns, it is usually conducted once a year.

The formula: $\frac{\text{cost of goods sold}}{\text{Average value of inventory}}$

YEAR	COST OF GOODS SOLD	AVG VALUE OF INVENTORY	INVENTORY TURN OVER RATIO
2006	70340.33	4076.86	17.25
2007	75687.45	4800.64	15.76
2008	184082.21	12583.99	14.63
2009	190053.62	16067.13	11.83
2011	419760.92	10185.20	41.21

RAW MATERIAL CONSUMED:



Interpretation:

The above graph shows inventory turnover ratio of the form. The ratio can be continuously decreased from the year 2006-09.The turnover ratio of the form is 17.25 in the year 2006. The decreased turnover shows good consumption of raw material. The ratio will be decreased to 11.83 in the year 2009 but it is increased in the year 2011 is 41.21.

STOCK LEVELS

During 2006-2007

The company requires 28889 units of billets/blooms to manufacture of steel for the year 2006-07.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 300days in a year.

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

= (10*96.29) + 2888.9

= 3851.9

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

= 28889*30/300

= 2888.9

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

= 28889/300

= 96.29

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

= 3851.9 – (96.29* 10+20/2)

= 2408

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

= 3851.9+1700-(96.29*10)

= 5551.9-962.9

= 4589

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

= 96.29*20

= 1925.8

e. Average stock level = **½(Minimum stock level + Maximum stock level)**

= 2408+4589/2

= 3496

During 2007-2008

The company requires 123596 units of billets/blooms to manufacture of steel for the year 2007-08.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 300days 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*10)

= 19815-4120

= 15695

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

= 412*20

= 8240

e. Average stock level = ½(Minimum stock level + Maximum stock level)

= 10300+15695/2

= 13000

During 2008-2009

The company requires 106066 units of billets/blooms to manufacture of steel for the year 2008-09.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 300days in a year.

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

= (10*354) + 10606.6

= 141476

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

= 106066*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 = ½(Minimum stock level + Maximum stock level)

= 8837+13864/2

= 11350

During 2009-2011

The company requires 184661 units of billets/blooms to manufacture of steel for the year 2009-11.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 300days 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 = **½(Minimum stock level + Maximum stock level)**

= 15389+24521.1/2

= 27649.55

CHAPTER-V

FINDINGS & SUGGESTIONS

- 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.

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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