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**A STUDY ON THE INVENTORY CONTROL MANAGEMENT WITH RESPECT
TO THE NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED, THE NILGIRIS.**

By

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Department of Management Studies
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A PROJECT REPORT
Submitted to the

FACULTY OF MANAGEMENT SCIENCES

In partial fulfillment of the requirements
for the award of the degree

of

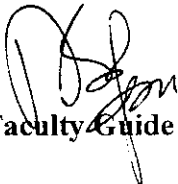
MASTER OF BUSINESS ADMINISTRATION


April, 2008

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Kumaraguru College of Technology
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BONAFIDE CERTIFICATE

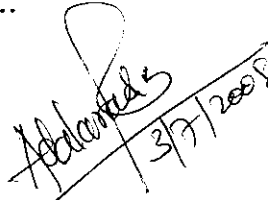
Certified that this project report titled “**A STUDY ON THE INVENTORY CONTROL MANAGEMENT WITH RESPECT TO THE NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED, THE NILGIRIS**” is the bonafide work of Ms. **DIVYA SURESH KUMAR (71206631013)** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


Faculty Guide


Director

Evaluated and vice-voce conducted on July 3, 2008.....


Examiner I


Examiner II

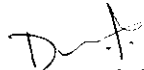
DECLARATION

I, hereby declare that this project report entitled as “**A STUDY ON THE INVENTORY CONTROL MANAGEMENT WITH RESPECT TO THE NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED, THE NILGIRIS**” , has undertaken for academic purpose submitted to Anna University in partial fulfillment of requirement for the award of the degree of Master of Business Administration. The project report is the record of the original work done by me under the guidance of **Mr. A. Senthil Kumar**, Lecturer, during the academic year 2007-2008.

I, also declare hereby, that the information given in this report is correct to the best of my knowledge and belief.

Date: 03.07.08

Place: Coimbatore


Divya Suresh Kumar

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ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

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Inventories constitute the most significant part of current assets of a large majority of companies in India. On an average, inventories are approximately 60 percent of current assets in public limited companies in India. Therefore the present study aims at studying the present inventory system followed at NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED, THE NILGIRIS and give recommendations for better inventory management.

The main objective was to study the Inventory Management System at Needle Industries (India) Private Limited. The various secondary objectives are :

- To study the present Inventory system followed.
- To evaluate the efficiency and trend of inventory.
- To determine the Economic Order Quantity of the materials.
- To determine and analyze the Operating Cycle of the company.
- To give suggestions for the introduction of Inventory Techniques.

The Research design used is the Analytical Research method. Analytical Research method is used as the facts and information are already available, and the information is analyzed to make an evaluation and decision. This study covers a period of 5 years from 2002-2003 to 2006-2007. The inventory control techniques were studied for the current year- 2007-2008. The data collection methods used in this study includes both Primary and Secondary sources of data. The various tools and techniques used to conduct this study on inventory management include EOQ, ABC, VED, Ratio Analysis and Operating Cycle Time Analysis.

The study is provided with insights to conclude that the Inventory Management System at the Needle Industries (India) Private Limited is found satisfactory. A Successful Inventory Management involves balancing the cost of inventory with the benefits of inventory. Therefore the company can use the suggestions given to ensure Successful Inventory Management.

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CHAPTER 1
INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 Background

Inventory Management

Inventories constitute the most significant part of current assets of a large majority of companies in India. On an average, inventories are approximately 60 percent of current assets in public limited companies in India. Because of the large size of inventories maintained by firms, a considerable amount of funds is required to be committed to them. It is therefore, absolutely imperative to manage inventories efficiently and effectively in order to avoid unnecessary investment. A firm neglecting the management of inventories will be jeopardizing its long-run profitability and may fail ultimately.

It is possible for a company to reduce its levels of inventories to a considerable degree, e.g. 10 to 20 per cent, without any adverse effect on production and sales, by using simple inventory planning and control techniques. The reduction in 'excessive' inventories carries a favorable impact on a company's profitability.

Every enterprise needs inventory for smooth running of its activities. It serves as a link between production and distribution processes. There is, generally, a time lag between the recognition of a need and its fulfillment. The greater the time-lag, the higher is the requirements for inventory. The unforeseen fluctuations in demand and supply of goods also necessitate the need for inventory. It also provides a cushion for future price fluctuations. The main purpose of inventory management is to ensure availability of materials in sufficient quantity as and when required and also to minimize investment in inventories.

Definition of Inventory

Inventory is the stock of any item or resource used in an organization. An inventory system is the set of policies and controls that monitor levels of inventory and determine what levels should be maintained, when stock should be replenished, and how large orders should be. By convention, manufacturing inventory generally refers to items that contribute to or become part of a firm's product output.

Nature of inventories

exists in a manufacturing company are as follows:

- Raw materials are those basic inputs that are converted into finished product through the manufacturing process. Raw materials inventories are those units, which have been stored for future productions.
- Work-in-process inventories are semi-manufactured products. They represent products that need more work before they become finished products for sale.
- Consumables are the materials that are needed to smoothen the process of production. These materials do not directly enter production but they act as catalysts, etc. Consumables may be classified according to their consumption and criticality.
- Spares are stocked differently from industry to industry and their consumption pattern also differs from the other inventory types. All decisions about spares are based on the financial cost of inventory on such spares and the costs that may arise due to their non-availability.

Need To Hold Inventory

Managing inventories involves tying up of the company's funds and incurrance of storage and handling costs. Though it is expensive to maintain inventories, there are three general motives for holding inventories. They are as follows:

- Transaction motive emphasizes the need to maintain inventories to facilitate smooth production and sales operations.
- Precautionary motive necessitates holding of inventories to guard against the risk of unpredictable changes in demand and supply forces and other factors.
- Speculative motive influences the decision to increase or reduce inventory levels to take advantage of price fluctuations.

It is not possible for a company to procure raw materials whenever it is needed. A time lag between demand and supply along with uncertainty in procuring raw materials due to factors such as strike, transport disruption, etc., may force firm to maintain sufficient stock of raw materials for uninterrupted production process. Other factors, which necessitate purchasing and holding of raw material inventories, are quantity discounts and anticipated price increase.

Work-in-process inventory builds up because of the production cycle. Production cycle is the time span between introduction of raw material into production and emergence of finished product at the completion of production cycle. Till production cycle completes, stock of work-in-process has to be maintained. Efficient firms constantly try to make production cycle smaller by improving their production techniques.

Stock of finished goods has to be held because production and sales are not instantaneous. A firm cannot produce immediately when customers demand goods. Therefore, to supply on a regular basis, a stock has to be maintained. Failure to supply products to customers when demanded would mean loss of the firm's sales to competitors. The level of finished goods inventories would depend upon the coordination between sales and production as well as on production time.

Objectives of Inventory Management

The main objectives of inventory management are operational and financial. The operational objective means that the materials and spares should be available in sufficient quantity so that the work is not disrupted for want of inventory. The financial objective means that investments in inventories should not remain idle and minimum working capital should be locked in it.

The following are the objectives of inventory management:

- To ensure continuous supply of materials, spares and finished goods so that production should not suffer at any time and the customers demand also be met.
- To avoid both over-stocking and under-stocking of inventory
- To maintain investments in inventories at the optimum level as required by the operational and sales activities.
- To keep material cost under control so that they contribute in reducing cost of production and overall costs.
- To eliminate duplication in ordering or replenishing stocks. This is possible with the help of centralizing purchases.
- To minimize losses through deterioration, pilferage, wastages and damages.
- To design proper organization for inventory management. Clear cut accountability should be fixed at various levels of the organization.
- To ensure perpetual inventory control so that the materials shown in stock ledgers should be actually lying in the stores.
- To ensure right quality goods at reasonable prices. Suitable quality standards will ensure proper quality of stocks. The price-analysis, the cost-analysis and value-analysis will ensure payment of proper prices.
- To facilitate furnishing of data for short-term and long-term planning and control of inventory.

Inventory Costs

In making any decision that affects inventory size, the following costs must be considered:

- Holding (or carrying) costs:

This broad category includes the costs for storage facilities, handling, insurance, pilferage, breakage, obsolescence, depreciation, taxes, and the opportunity cost of capital. Obviously, high holding costs tend to favor low inventory levels and frequent replenishments.

- Setup (or production change) costs:

To make each different product involves obtaining the necessary materials, arranging specific equipment setups, filling out the required papers, appropriately charging time and materials, and moving out the previous stock of materials.

- Ordering costs:

These costs refer to the managerial and clerical costs to prepare the purchase or production order.

- Shortage costs:

When the stock of an item is depleted, an order for that item must either wait until the stock is replenished or be cancelled.

Tools and Techniques of Inventory Management

Effective Inventory management requires an effective control system for inventories. A proper inventory control not only helps in solving the acute problem of liquidity but also increases profits and causes substantial reduction in the working capital of the concern. The following are the important tools and techniques of inventory management and control:

- Determination of stock levels
- Economic order quantity
- Just-in-time inventory system
- ABC Analysis
- VED Analysis
- Inventory turnover ratios
- Perpetual Inventory System
- Aging schedule of inventories
- Inventory reports

Advantages of Inventory Control

The various advantages of inventory control are:

- Efficient management of inventory ultimately results in the maximization of owner's wealth.
- Introduction of proper inventory control system help in keeping inventory investment in the inventories as low as possible.
- Reduce chances of going out of stock release, more capital for other operations.
- Increase profitability of the organization.
- Advantages of price discounting bulk purchasing.

Thus the firm should minimize investment in the inventories. An optimum level inventory should be determined on the basis of trade off between cost and benefits associated with the level of inventory

1.2. Review of Literature

The purpose of this chapter is to review the various studies conducted and made to consolidate the views and studies to determine the effectiveness of different factors which influence the management of inventory in a manufacturing industry.

S Manaster¹ and SC Mann² said, “We use futures transaction data to investigate cross-sectional relationships between market-maker inventory positions and trade activity. The investigating documents strongly that traders control inventory throughout the trading day. Despite this evidence of inventory management, typical inventory control models predict that market-maker reservation prices are negatively influenced by inventory. Surprisingly, our evidence shows, as a strong and consistent empirical regularity, that correlation between inventory and reservation prices are positive. We interpret the evidence as consistent with active position taking by futures market floor traders.”

Erwin van der Laan, Marc Salomon, Rommert Dekker, Vol. 45, No. 5 (May, 1999³) said, “Production planning and inventory control in systems where manufacturing and remanufacturing operations occur simultaneously. Typical for these hybrid systems is, that both the output of the manufacturing process and the output of the remanufacturing process can be used to fulfill customer demands. Here, we consider a relatively simple hybrid system, related to a single component durable product. For this system, we present a methodology to analyse a PUSH control strategy (in which all returned products are remanufactured as early as possible) and a PULL control strategy (in which all returned products are remanufactured as late as is convenient). The main contributions of this paper are (i) to compare traditional systems without remanufacturing to PUSH and to PULL controlled systems with remanufacturing, and (ii) to derive managerial insights into the inventory related effects of remanufacturing.

¹ University of Utah, USA

² Texas Christian University, USA

³ Erwin van der Laan, Marc Salomon, Rommert Dekker,” Inventory Control in Hybrid Systems with Remanufacturing ” Luk Van Wassenhove ,*Management Science*, Vol. 45, No. 5 (May, 1999), pp. 733-747

*Johanna Småros, Juha-Matti Lehtonen, Patrik Appelqvist, Jan Holmström, Vol: 33 pp: 336 - 354*⁴, Said, "Information sharing practices such as vendor-managed inventory (VMI) give manufacturers access to more accurate demand information, e.g. customer sales data, than before. The value of this type of information sharing has been established in many studies. However, most of the research has focused on the ideal situation of the manufacturer having access to information from all downstream parties. In practice, this is rarely the case. In this paper, discrete-event simulation is used to examine how a manufacturer can combine traditional order data available from non-VMI customers with sales data available from VMI customers in its production and inventory control and what impact this has on the manufacturer's operational efficiency. The simulation model is based on a real-life VMI implementation and uses actual demand and product data. The key finding is that even for products with stable demand a partial improvement of demand visibility can improve production and inventory control efficiency, but that the value of visibility greatly depends on the target products' replenishment frequencies and the production planning cycle employed by the manufacturer."

Jeffrey Preston Bezos⁵, the founder of Amazon.com conducted this study when he launched the company when he realized that Internet provided immense scope for online trading. Although the site was originally launched as an online bookstore it eventually offered several other products to keep abreast of the competition. The study takes a look at the different products and features offered on the site. The case also discusses Amazon's value propositions and its criteria for choosing strategic partners. It then elaborates on the strategies adopted by Amazon for managing its inventory. It also explains Amazon's decision to outsource inventory management to distributors. The study takes a look at Amazon's decision to sell the products of competing retailers on its site. It concludes with a brief note on the future challenges in Amazon's warehouse management.

4

Johanna Småros, Juha-Matti Lehtonen, Patrik Appelqvist, Jan Holmström, "The impact of increasing demand visibility on production and inventory control efficiency", *International Journal of Physical Distribution & Logistics Management*, Vol: 33, Issue:5(2003), pp. 336 - 354

⁵ Jeffrey Preston Bezos, "Amazon.com-The Ultimate Online Shopping Destination", *ICMR*,(2003), pp. 1-13.

Nordstrom⁶ in his study dealt with the inventory and merchandise management efforts undertaken by the US-based specialty retailer Nordstrom during the late 1990s and early 21st century. After providing a brief background of the company, the study details the problems it landed in by the early 1990s due to the changing industry dynamics. The study then analyzes how Nordstrom realized that its poor performance was largely due to its not adopting modern inventory management practices. Thereafter, the features and implementation of the new perpetual inventory management system adopted by the company are examined in detail. The study ends with information on how Nordstrom was reaping the initial fruits of its efforts in late-2003. Finally, it provides information on the two general inventory models adopted by firms - the P and Q systems.

“Just-in-Time Requisition and Inventory Management System” is a study by James M Johnson and Douglas A Momyer⁷. In their study in accordance with the present invention, a requisition and inventory management system is provided which employs both a host computer and a local computer which can be linked to permit two-way data communications in a real time environment. Each computer has an associated database which can be accessed by that computer. By accessing its respective database, each computer can build and transmit to the other computer communications blocks of data relating to a particular requisition of an item in Just-in-Time (JIT) inventory or to the management of the JIT inventory. The other computer can then use the received data to continue processing of the requisition or to update its JIT inventory records. Thus requisition records are created from a real-time interaction between the host and local computers, with each computer using data from its respective database in conjunction with information entered by a customer service representative (CSR) operating the local computer. The system of the present invention also utilizes means for automatically determining which items in the JIT inventory are likely to require replenishment. The system then proposes a purchase or transfer order for an optimum quantity of the item, which the CSR may accept or modify. Thus the study gives a detailed procedure of the JIT system.

⁶ Nordstrom, “Nordstrom's Perpetual Inventory System”, ICMR,(2004),pp. 1-16.

⁷ James M Johnson and Douglas A Momyer,

1.3. Statement of the Problem

Inventories constitute the most significant part of current assets of a large majority of companies. Because of the large size of inventories maintained by firms, it is absolutely imperative to manage inventory effectively and efficiently in order to avoid unnecessary inventory. Therefore the present study aims at studying the present inventory system followed at NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED, THE NILGIRIS and give recommendations for better inventory management.

1.4. Objectives of the Study

Primary Objective:

To study the existing Inventory Management System.

Secondary Objectives:

- To study the present Inventory system followed.
- To evaluate the efficiency and trend of inventory.
- To determine the Economic Order Quantity of the materials.
- To determine and analyze the Operating Cycle of the company.
- To give suggestions for the introduction of Inventory Techniques.

1.5. Scope of the Study

This study can be used by Needle Industries to effectively maintain their inventory. The study is being carried out, as it is necessary to identify the utilization of inventory. It gives the detailed operations related to the firm and its efficiency to be improved. The study suggests techniques that can be used by the company in managing their inventories and the reduction in 'excessive' inventories will carry a favorable impact on a company's profitability.

1.6. Methodology

1.6.1. Type of Study

The research design is the blue print of the research study for the collection, measurement and analysis of data. It is the conceptual structure within which research is conducted. The Research design used is the Analytical Research method. Analytical Research method is used as the facts and information are already available, and the information is analyzed to make an evaluation and decision.

1.6.2. Period of Study

This study covers a period of 5 financial years from 2002-2003 to 2006-2007. The inventory control techniques were studied only for the current year-2007-2008.

1.6.2. Method of Data Collection

The data collection methods used in this study includes both Primary and Secondary sources of data.

- **Primary Data:**

Primary data have been collected from the Organization. These data were obtained from the interactions with the financial executives in the company. These are in the form of verbal reports, computer reports etc.

- **Secondary Data:**

Secondary data are drawn from annual reports, stock registers and internal records of the company.

1.6.3. Tools of Analysis

The various tools and techniques used to conduct this study on inventory management includes-

- EOQ
- ABC
- VED
- Ratio analysis
- Operating cycle time analysis

1. Economic Order Quantity (EOQ):

A decision about how much to order has great significance in inventory management. 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 ordering costs. In determining EOQ, it is assumed that cost of managing inventory is made up solely of two parts:

- **Ordering costs:** These are the costs, which are associated with the purchasing or ordering of materials. The ordering costs are totaled up for the year and then divided by the number of orders placed each year. The Planning Commission of India as estimated these costs between Rs.10 to Rs.20 per order.
- **Carrying costs:** These are the costs for holding inventories. These costs will not be incurred if inventories are not carried.

The formulas so derived are given below:

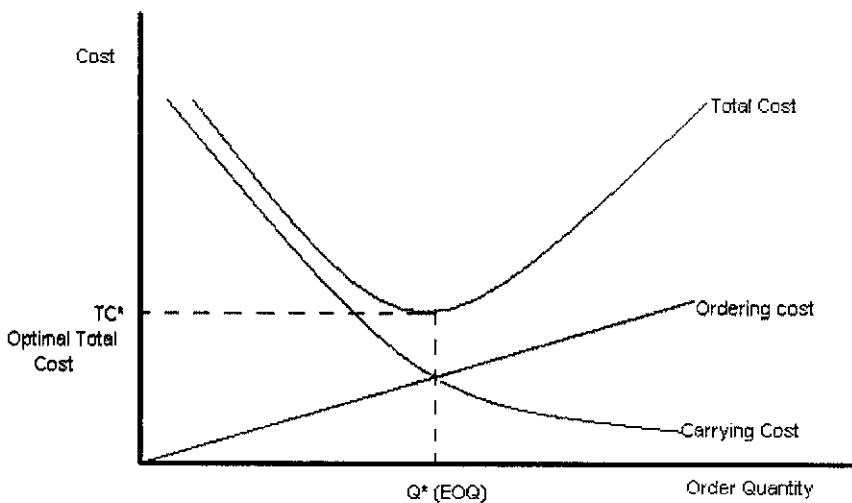
$$\text{Economic Order Quantity } Q^*(\text{EOQ}) = \sqrt{\{2DC_o / Ch\}}$$

Where, C_o is cost of placing an order (Rs/order).

D is annual demand/consumption (number of units).

Ch is annual inventory carrying/ holding cost

$$\text{Optimal Total Cost (TC}^*) = \text{Annual Carrying Cost} + \text{Annual Ordering Cost}$$



2. ABC Analysis:

The materials are divided into a number of categories for adopting a selective approach for material control. It is generally seen that in manufacturing concern, a small percentage of items contribute a small percentage of value. In between these two limits there are some items, which have almost equal percentage of value of materials. Under ABC analysis, the materials are divided into three categories viz., A, B and C.

Past experience has shown that almost 10 per cent of the items contribute to 70 per cent of value of consumption and this category is called "A"

Category. About 20 percent of the items contribute about 20 per cent of value of consumption and this is known as category “B” materials. Category “C” covers about 70 per cent of items of materials, which contribute only 10 per cent of value of consumption.

ABC Analysis helps to concentrate more efforts on category A, since greatest monetary advantage will come by controlling these items. An attention should be paid in estimating requirements, purchasing, maintaining safety stocks and properly storing of “A” Category materials. These items are kept under a constant review so that a substantial material cost may be controlled. The control of “C” items may be relaxed and these stocks may be purchased for the year. A little more attention should be given towards “B” Category items and their purchase should be undertaken at quarterly or half-yearly intervals.

3. VED Analysis:

VED Analysis is similar to the ABC Classification except that it is carried out for spare parts inventory. Classification done on the basis of criticality of the materials is known as V-E-D classification, where the items are classified as Vital, Essential and Desirable.

- I. Vital items are those materials, which are very critical for the operations and do not permit any corrective time i.e. they can cause havoc and the production would come to stop.
- II. Essential materials are comparatively less vital and work without them cannot be managed for few days.
- III. All remaining materials are known as Desirable items.

V-Class materials have to be stocked adequately to ensure operation of the plant, because non-availability of these materials can cause stop the wheels of the organization.

4. Ratio Analysis:

Ratio analysis is one of the techniques of financial analysis where ratios are used as a yardstick for evaluating the financial condition and performance of a firm. A financial ratio is the relationship between two accounting figures expressed mathematically. It is with the help of ratios that the financial statements can be analyzed more clearly and decisions are made from such analysis.

Steps involved in Ratio Analysis:

The following are the four steps involving in Ratio Analysis:

- Selection of relevant data from the financial statement depending upon the objectives of analysis
- Calculation of appropriate ratios
- Comparison of the calculated ratios with the ratios of the same firm in the past
- Interpretation of the ratios.

5. Operating Cycle Time Analysis:

Operating cycle is time duration required to convert sales, after the conversion of resources into inventories into cash. A firm requires many years to recover the initial investment in fixed assets such as plant and machinery or land and buildings whereas the investment in current assets such as inventories and debtors is realized during the firm's operating cycle which is usually less than a year. The operating cycle of a manufacturing firm involves three phases:-

- Acquisition of resources:

Acquisition of resources such as raw materials, labour, power, fuel etc.

- Manufacture of the product:

It includes conversion of raw material into work-in-progress into finished goods.

- Sale of the product:

Sale of the product either for cash or for credit. A credit sale creates book debts for collection.

The time that elapses between the purchase of raw materials and the collection of cash for sales is referred to as gross operating cycle. The time length between the payment of raw materials, purchases and the collection of cash for sales is referred to as the Cash conversion cycle or the Net operating cycle. From the financial statements of the firm, the Inventory period, the Accounts receivable period and the Accounts payable period can be estimated. Gross Operating Cycle is the sum of Inventory Conversion Period and the Debtors Conversion Period. The Inventory Conversion Period is the sum of Raw material Conversion period, WIP Conversion Period and finished goods Conversion period. The Net Operating Cycle is the difference between the Gross Operating Cycle and the Payables Deferral Period.

1.7. Limitations

The study has the following limitations:

- As the study depends more on secondary data, the limitations of the secondary data also apply to the results of the study.
- The study uses only a few inventory control techniques like EOQ, ABC and VED Analysis.
- The figures taken for analysis are mostly approximate.
- Only major items have been selected for the purpose of introducing Inventory control techniques in the present study.

1.8. Chapter Scheme

The chapter scheme of the project report consists of the following:

a) Chapter 1:

The first chapter consists of the Introduction to the study. The introduction part of the report structure includes the background of the study, review of literature, objectives of the study, statement of the problem, scope of the study, the methodology which consists of the type of study, period of study, method of data collection and the tools for analysis, limitations and also the chapter scheme.

b) Chapter 2:

The Chapter 2 consists of the Organization Profile which includes the history of the organization, the details of the management, the structure of the organization, products profile and the market potential, competitive strength of the company, the future plans and a brief description of the various functional areas of the organization.

c) Chapter 3:

The third chapter deals with the Macro – Micro Analysis which includes the details of the prevailing scenario with respect to the industry and the organization undertaken for the study. In this study the macro perspective is the recent trends in the small scale industry and the micro perspective is the trend followed in Needle Industries (India) Pvt Ltd.

d) Chapter 4:

The fourth chapter- Data Analysis and Interpretation gives the tabular distribution of the collected data, analyzed percentage values, graphical representation results.

e) Chapter 5:

This fifth and final chapter is the Conclusion of the study which deals with the findings of the study and gives suggestion that the researcher put forward to the management.

CHAPTER 2

ORGANISATION PROFILE

CHAPTER 2

ORGANISATION PROFILE

2.1. History

The corporate headquarters and manufacturing facilities of Needle Industries (India) Private Limited are located in the Nilgiri Mountains, 2200 metres above sea level, in Southern India. The company was incorporated in 1949 as a subsidiary of a major British manufacturer of hand sewing needles, knitting pins and other hard haberdashery products. Manufacture commenced with the very simple gramophone needle.

Over the years the tiny company managed not only to survive, but to grow through its own resources into what it is today- the prime global source of hand sewing needles, knitting pins and other allied products.

In the early years, all products were marketed under well known brands belonging to the British principals. The sixties saw the shareholding begin to shift to Indian hands and with this came the introduction of the company's own brand name PONY, now a household name in most parts of the world. In the next decade, complete control of the company was transferred to the hands of the management in India.

As a result of this, doors to world markets, which had hitherto been closed, were thrown wide open. The far thinking management team, backed by technical excellence and the highest standards of quality, took full advantage of this opportunity and embarked upon a major export drive. Over the last ten years, the exports of the company have grown. According to the Managing Director, “the only way to break into international markets was by setting high quality benchmarks. It may be recalled that 20 years ago, the Made in India tag did not have much standing in international markets. Today, the company, which has a turnover of Rs 62 crore, has become the prime global source of sewing needles, knitting pins and allied products.”

The company has been exporting its products for several years, and now for the first time exported its technical know-how and management ability. The immediate spurt in exports, led to the company earning Export House Status in 1982. This status continues because of the company's excellent performance in global markets.

This spectacular success on the export front has been due to a team of truly dedicated people, supported by constant improvement in technology and methods of production. The exacting standards set by discerning customers have contributed greatly to in-house research and development programmes. The expertise now available enables the company to update and modernise technology independently.

The company started with the manufacture of the simple, but precise, Gramophone Needle-which is still manufactured against special orders. As the company grew other products were added to the range. In the late 1950's hand sewing needles. In the 1960's snap fasteners, hooks and eyes, knitting pins, jeans buttons and four part fasteners. In the 1970's they added safety pins and plastic products. In the 1990's plastic and pearl head pins and, in 2001, glass headed pins. Apart from these products the company has for thirty-five years manufactured an extensive range of surgical suture needles. The last few years have seen the addition of a range of haberdashery sourced from other manufacturers and packaged in-house.

Needle Industries manufactures around 1000 products ranging from sewing needles to knitting pins, snap fasteners, pins, soft haberdashery, cross stitch kits etc and is continuously expanding its product portfolio as per market needs.

This vast range of products is all manufactured in the company's own, well equipped and modern facilities, 2, 200 metres above sea level in the Nilgiri Mountains of South India. How the factory and corporate headquarters of Needle Industries came to be located in the Nilgiris is an interesting story. When the British Company was looking at setting up an Indian subsidiary in India, back in the late-1940s, one of the directors asked his old school friend, a planter in Kotagiri, if he could suggest a good location. At that time Tamil Nadu, or Madras State as it was called, had Prohibition and the company, which owned a brewery near Ooty put it up for sale. With

the climate playing an important part in the selection of the location, the British company decided to locate its Indian subsidiary 2,200 metres above sea level. Besides a global presence with a 'Made in India' brand, Needle Industries has impacted the community around. Long before it became fashionable, the company put together a corporate social responsibility programme that included laying more than 30,000 sq ft of sidewalks in Ooty town.

The company was established in these mountains mainly because of its climatic condition, which is very favorable in manufacturing needles and its allied products as it prevents rusting and corrosion. The company has set up 5 factories where each of them manufactures a different range of products. Besides its manufacturing facilities, the company also has full fledged machine shops and tool rooms in which all production equipment is designed and built. The company has also set up around 20 sales offices in different regions of India to enhance their sales all over the country. The sales offices are located at major cities which include Delhi, Mumbai, Chennai, Kolkatta, Bangalore, Hyderabad, Ahmedabad, Indore, Patna, Lucknow etc.,.

Apart from a diverse product range, the company also manufactures packages and rolls-out products for other private labels. For instance the US-based Lion Brand of products is manufactured, packaged in-house, under the Lion brand name. They run 60-70 brands for other private labels. In fact in certain cases they even do the retail marking for these private labels.

The company has been found to conform to the quality management system standard ISO 9002:1994. Over the past fifty years the company has built a worldwide reputation for quality and service, and now markets its products in approximately 80 countries on all six continents. 68 per cent of the company's turnover is from exports. The company's strength lies in their ability to handle large volumes and that they are able to further expand on that. However, their entire product range is not sold in any country as the needs differ from region to region. Probably the broadest part of their range of products is sold in Russia currently. In terms of volumes, Western Europe is a large market for them. But given the current knitting boom in North America, they are

expecting North America to overtake Western Europe this year. The company's thrust on exports apart, its largest consumer market continues to be India.

However, the home market remains the largest for Pony needles and accessories, accounting for 30 per cent of sales. The difference in India is that people knit and sew out of necessity while in the West knitting, sewing or crocheting is a hobby. For instance, in India the largest customers for sewing needles are tailors. The company's main competitors are small-scale manufacturers whose products retail at almost 50 per cent less than Pony products.

The company has achieved a growth in all their products except for suture needles and plastic knitting pins. The sales of suture needles remained the same where as the plastic knitting pins had temporarily set back owing to the excessive inventory in the market.

Welfare facilities in the form of a subsidized canteen, a clinic, a company store, a thrift society, recreation center, and sports field have been built in step with the growth of the company. The company supports a church, a temple and a mosque, an example of national integration.

The company takes great efforts on conserving energy. They have purchased new equipment with energy saving in mind. The wind turbine generator provides 70.25% of the electricity consumed by the company. Therefore, the saving in the cost of energy is around 8.739 million.

QUALITY POLICY

To produce the best in the world, remain competitive, cultivate customer relations and thereby guarantee customer satisfaction and loyalty.

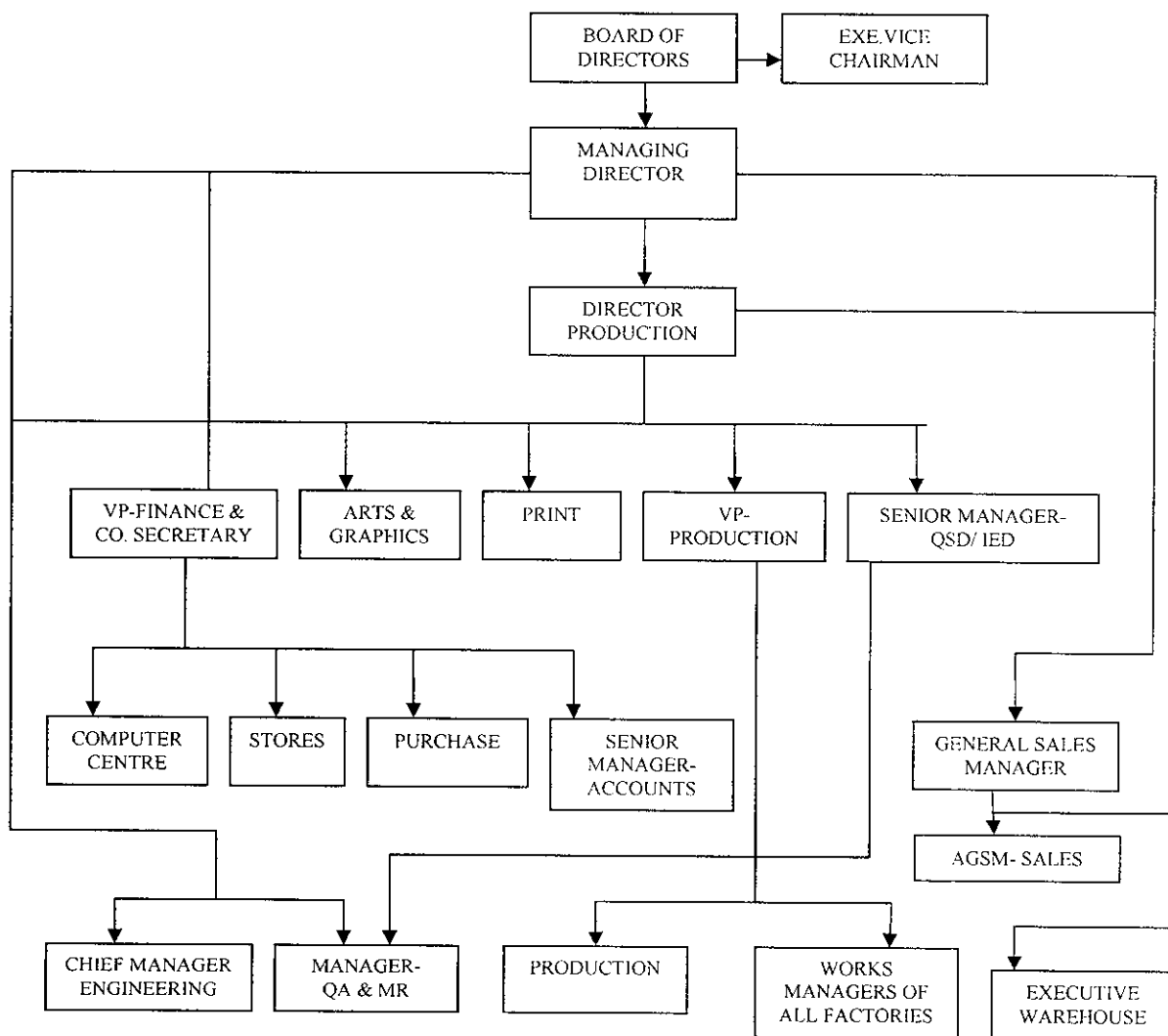
Objectives to achieve quality policy

- To conform to the international quality system requirements
- To bring about total conformity of all laid down specifications
- To emphasize continual improvement
- To focus on reduction of operating cost on a continual basis
- To develop human resources and strengthen employee-employer relations

2.2. Management:

Once the complete control of the company was transferred from the British to the hands of the management in India, the company was taken over by the Devagnanam group, who has been managing the company for the last fifty years from generation to generation. The present Managing Director of the company is Mr. T.A. Devagnanam. His family members are also equally dedicated in managing the company. His wife, Mrs. Vasanthi Devagnanam, is the Director Production while his son Mr.Theo Devagnanam takes care of the factory activities. The Secretary of the company is Mr.Ranganathan who is also the Vice President-Finance.

2.3. Organisation Structure:



2.4. Product Profile and Market Potential:

Needle Industries manufactures around 1,000 products ranging from sewing needles to knitting pins, snap fasteners, pins, soft haberdashery, cross stitch kits etc and is continuously expanding its product portfolio as per market needs.

The major range of products manufactured at the company's own premises includes:

- Hand sewing needles
- Knitting pins
- Crochet hooks
- Safety pins
- Pony pearl
- Garment fasteners
- Soft Haberdashery
- Sewing aids and accessories
- Knitting accessories
- Surgical suture needles

Manufactured from high carbon steel wire, drawn to perfection, **PONY** and **RATHNA**, **hand sewing and hardware needles** are crafted to meet the exacting standards of the 21st century. Finished with the most modern bright nickel plating systems, the company offers what is truly the best needle in the world.

Pony safety pins are manufactured with the best quality high tensile steel and brass wire available. The steel safety pins are offered in nickel, nickel-free and nickel black finishes. Brass pins are offered with nickel, nickel-free, gilt and black finishes. The full laundry range is also available.

In the past few years they have put together a comprehensive range of **pins** to cover the entire requirements of the haberdashery world. Their range comprises of plastic and pearlised head pins made with high tensile steel wire, and glass head pins made with hardened and tempered high carbon steel wire. All are manufactured in Ketti. In addition, they offer a wide range of straight pins made from tempered steel, mild steel, or brass. The pins come in a vast variety of packaging styles ranging from rosettes, carded hinged boxes and colour coded circular boxes, to name a few.

Knitting pins and knitting accessories have been manufactured in Ketti for more than thirty years. The company's ability to be flexible on the production line has enabled them to develop in-house and manufacture for their customers around the world, the types, sizes and finishes unique to each country. The recent additions to our knitting line include **circular crochet hooks, double ended Tunisian hooks** and the full complement of '**In-Line**' **crochet hooks**. 'In-Line' hooks are available in both the regular grey range as well as in the Pony Pearl line. A recent development towards increasing the variety is **anodised aluminium knitting pins** in a wide spectrum of colours.

Apart from the classic bright nickel and black finishes, **Pony snap fasteners and hooks and eyes**, are now available in the additional nickel - free finish. Their full range of snap fasteners and hooks and eyes are made from brass and formed to perfection, they are totally rust proof.

The brand name for **Surgical Suture needles** is saber suture needles. Their saber suture needle factory has the ISO 9001 and CE certification. They manufacture both the atraumatic as well as eye suture needles which in turn are either round bodied or triangulated. They have an installed capacity of 2.5 lack dozens suture needles per month.

Gramophone Needles were the first product that the company manufactured. In certain respects, they are needles of the simplest form. Though simple, they brought immense pleasure to users by reproducing that concord of sweet sounds commonly known as music. They are made from high carbon steel wire, pointed to perfectly match the groove on the disc and highly polished. They don't require any type of plating to them corrosion-free. Though out-dated several years ago, the company still manufactures this product and makes it available to antique collectors all over the world.

2.5. Competitive Strength of the company:

Needle Industries (India) Private Limited is the biggest industry manufacturing hand sewing needles and pins in the organized sector. The other industries manufacturing the like products are either unorganized or small scale industries. The company's main competitors are small scale manufacturers whose products retail at almost 50 per cent less than Pony products. At the export level the company faces competition from China but they easily handle it. Therefore Pony has a monopoly market for its products both at the national and the international level. Therefore in the present situation the company is free of competition and can concentrate on expanding their market across the globe. The company is highly competitive in nature and constantly works towards maintaining their position. The company has received various awards for their excellence in exports. Most recently the company once again, has been awarded an All India Certificate of Export Excellence in recognition of their exports during 2005-2006. The Certificate was awarded by the Engineering Export promotion council of India.

2.6. Future plans:

NEEDLE Industries (India) Private Limited, the prime global source of hand-sewing needles, knitting pins and accessories and other allied products, is looking at increasing its market share in overseas markets by broad basing its range of products. With the brand name having been established worldwide, the company would now like to focus on increasing market share across various markets. While they have a reasonable presence in South Africa and have over the last five years gained considerable ground in South and Central America, they are yet to make their presence felt in certain pockets of the region. In Africa, this has been largely on account of competition from China. And the management is looking at strengthening their position in the Indian market through even better.

The construction of the prototype machine for the manufacture of steel crochet hooks has commenced. The complete equipment for the manufacture of 3 sizes of pressed metal thimbles has been completed and the fourth is under construction. The company constantly takes efforts in planning their future plan of actions.

The successful development and manufacture of the unique joint, between the flexible and rigid portions of circular knitting pins, led to the filing of an application for an international patent for the joint. This joint is currently used on wooden circular knitting needles only and ways and means of extending its use to plastic and metal circular knitting needles is being explored.

2.7. Description of various functional areas:

Like any other industry, this company also has various functional areas which include:

- Purchasing Department
- Production Department
- Accounts Department
- Arts and Graphics Department
- Sales Department
- Quality Control Department
- Packaging Department
- Research and Development

2.7.a. Purchasing Department:

This department identifies various suppliers and places orders to receive raw materials as per the requirements from the production department. The company maintains only the required quantity of raw materials. The inventory is controlled based on the average method.

2.7.b. Production Department:

The production department deals with the manufacturing activities. The company produces products only based on the orders received. The company tests the various materials at its own laboratory. This department also decides on the pricing issues. The company is very particular about maintaining uniform pricing all over the globe. The difference in prices occurs only because of the differing vat rates. They have five factories where each produces a different line of products.

2.7.c. Accounts Department:

As any other industry the accounts department takes care of all the financial issues of the company both domestic and export related. This Department is divided into 7 sections which include the banking sector, billing sector, costing sector, internal auditing sector, export documentation sector, finalization sector, and the cash management sector. The company follows significant accounting policies. The accounts are prepared on historical cost convention and in accordance with the Generally Agreed Accounting Policies (GAAP) and applicable accounting standards.

2.7.d. Arts and Graphics Department:

This department designs their own products which is feasible for the company to produce and market. This is one of the great reasons for the success of this company to develop so many innovative products.

2.7.e. Sales Department:

The sales department is concerned with the sales of their products both at the domestic national market and the export proceeds. This department controls all the 20 sales offices of the company all around the country.

2.7.f. Quality Department:

The company has a separate department, which ensures that the products confirm to the quality requirements. The company makes sure that they confirm to the quality management system standard ISO 9002:1994.

2.7.g. Packaging Department:

The company's main outreach programme is the packaging, which is outsourced to eight to ten women's groups in and around the Nilgiris. Keeping in mind the fact that the Pony brand is available in upmarket craft stores in the West, the packaging is elegant and completely hand-done. The products and the packaging material are delivered and collected upon completion from the women's groups. In this way the company is fulfilling its corporate social responsibility by encouraging the growth of women self-help groups. The packaging has been painstakingly developed in keeping with the company's commitment to the preservation of the environment. The simplicity of design allows easy access to the product. The absence of adhesives, staples or other residual materials ensures the packing materials are always separate thus encouraging their recyclable disposal. The striking sunrise, depicted on the packaging, underlines the company's dedication to offer only the best through ongoing development and continuous improvement.

2.7.h. Research and Development:

The company has its own research and development department through which the company enjoys the benefits of better quality, cost savings, expansion of product range leading to increased market share, energy savings and pollution control. The company through its technology absorption has achieved to set up a suture needles automation project, developed 12 new packaging machines that has replaced partly the traditional loose wrapped packs and a complete range of Bamboo Knitting Needles have been developed, hitherto been imported from Japan.

CHAPTER 3

MACRO-MICRO ANALYSIS

CHAPTER 3

MACRO-MICRO ANALYSIS

Macro Analysis

Background

Engineering industry is integrated with various core sectors for its demand. The products covered under the engineering industry are largely used as input to the capital goods industry. Hence the demand of this sector is a derived demand of the capital goods industry. The demand is thus derived primarily from capacity creations in sectors like infrastructure and general manufacturing including process industries.

The enterprise mix of the Indian engineering industry, which is reasonably technology intensive, comprises primarily large Indian companies without foreign collaborations, subsidiaries of multinational companies (MNCs), joint ventures of domestic and foreign companies, medium sized companies maintaining regional dominance. While smaller players (including some unorganised players) are present in the Indian Engineering industry, they primarily act as vendors to medium and large players in the heavy engineering industry and form part of the light engineering industry.

The Light Engineering Industry is a diverse industry with a number of distinctive sectors. This industry includes low-tech item castings, forgings and fasteners to the highly sophisticated microprocessors- based process control equipment and diagnostic medical instruments. This group also includes industries like bearings, steel pipes and tubes, etc.

Size

The Indian engineering industry, including the transport equipment segment, is estimated at around Rs. 1.2 trillion. Light engineering contributes to about 20% of the entire engineering industry amounting to approximately Rs. 20-25 billion, while heavy engineering contributes the rest.

Structural Characteristics

- The products covered under the light engineering industry are largely used as input to the capital goods/heavy engineering industry. Hence the demand of this sector is dependent on the capital goods industry to a considerable extent.
- While the light engineering industry caters to various types of industries, sectoral cyclicity can be observed in major sectors like power, refineries, manufacturing, infrastructure, mining, which also affect the light engineering industry.
- The light engineering industry is predominantly characterized by low capital intensity and technology requirements and its high labour intensity results in a large number of small and unorganized players mainly in the low value added segments that contribute about 30-40% of the domestic production by value. The high value added segments are dominated by a few medium to large scale companies. Large unorganized sector also leads to a high degree of competition in the industry.
- In some specific areas including hydraulic machines, CNC machines, and equipment for specific purposes, high tensile fasteners, the competition from the unorganized sector is comparatively lower than areas like general machine tools, mild steel fasteners, small gears etc.
- Over 80% percent of the consumption by value fall under heavy engineering (typically capital goods) while light engineering contributes the rest.
- The raw materials contribute almost 55% of the operating costs of light engineering companies.
- The light engineering industry is endowed with a diverse mix across a varied range of end-user segments which means low volatility in revenues over a normal business cycle. But, at the beginning of a widespread economic slowdown, cancellation of investments on capital goods, adversely affects the light engineering industry much before it does other industries.

- Conversely, the light engineering industry is also among the last to gain from an upturn as capacity creation occurs after end-user industries have fully exhausted their capacities and long-term demand projections permit so.

Policy

- The demand in the engineering sector is derived primarily from new investments and modernization and upgradation of existing facilities. While in the manufacturing sector, the demand is driven both by the government as well as the private sector, the demand from infrastructure sector comes mainly from projects taken up by the government.
- Recent growth initiatives in infrastructure sectors like power, roads, ports, water supply are primarily government policy driven. They are therefore, expected to maintain the demand for the Indian light engineering industry.
- The Government has extended the DEPB Scheme by one year which is expected to benefit exporters.

Outlook

- The demand in the engineering sector is expected to sustain primarily on account of the buoyant industrial production and the government's focus on infrastructure development in the country, which is expected to continue in the medium term.
- The light engineering sector has been growing, driven by growth in end user industries and the new projects being taken up in the power, railways, infrastructure development, private sector investment fields etc.
- The investments in infrastructure are likely to accelerate and manufacturing sector is also showing signs of recovery. Key indicators that point towards a positive outlook for the sector include:
 - Ongoing investments by national Thermal Power Corporation Ltd (NTPC), National Hydropower Corporation Ltd (NHPC), National

Highways Authority of India (NHAI), State Highway Authorities and private investments in institutional/commercial buildings.

- TNPCC and NHPC's new capacity additions programmes with expected addition of 9,370 MW; new gas based power projects from private players; over 60,000 MW generation capacity coming up during the 11th Five Year Plan. Expected investments in new berths in major ports as most ports have reached peak berth utilisation.
- Metals and refining sector are in a positive capex phase.
- Around Rs. 1,720 billion expected to be spent on the various National Highway projects for the period 2005-06 to 2012.

Major beneficiaries from these are likely to include light equipment used in construction, grinders and drilling machines, welding machines, Lathes and machining related equipment, industrial fasteners, besides some special purpose machines.

- India is emerging as a preferred outsourcing destination for design and manufacture of heavy machinery and equipment. India has a large pool of skilled labour force and the labour costs are amongst the lowest in the world.
- Indian companies are benefited by cost-advantage in production of machinery and equipment, resulting in significant potential for **engineering exports**. Though labour productivity in India is lower than the global average, overall labour costs in India are still less than half of those in the developed countries.
- Exports of engineering products are expected to grow to around US\$27 billion by FY2010. India's engineering exports are likely to increase from 0.5% to about 0.79%.
- Despite rising raw material costs and higher imports, players reported a substantial jump in overall profits in 2006-07 (based on 9 months results), on the back of strong volume growth. CRISIL research expects volume growth to continue in 2007-08 while profitability is expected to remain stable.

Micro Analysis

The Needle Industries (India) Private Limited is classified under the Light Engineering category of Industries. The company was incorporated in 1949 as a subsidiary of a major British manufacturer of hand sewing needles, knitting pins and other hard haberdashery products. Manufacture commenced with the very simple gramophone needle.

Over the years the tiny company managed not only to survive, but to grow through its own resources into what it is today- the prime global source of hand sewing needles, knitting pins, snap fasteners, surgical needles and other allied products.

The company has been found to conform to the quality management system standard ISO 9002:1994. Over the past fifty years the company has built a worldwide reputation for quality and service, and now markets its products in approximately 80 countries on all six continents. 68 per cent of the company's turnover is from exports.

According to the Managing Director, "the only way to break into international markets was by setting high quality benchmarks. It may be recalled that 20 years ago, the Made in India tag did not have much standing in international markets. Today, the company, which has a turnover of Rs 62 crores, has become the prime global source of sewing needles, knitting pins and allied products." The company holds a market share of around 60% in the international market and around 90% in the domestic market.

The company has achieved A silver shield for star performance as large enterprise for 2004-2005 from Engineering Export Promotion Council (EEPC), Southern Region, All India Certificate of Export Excellence for 2001-2002 from the EEPC, Certificate of Export Excellence for 2002-2003 from EEPC, All India Certificate of Export Excellence in recognition of their exports during 2005-2006 from the EEPC and IDBI Bank Gold Card Certificate. The company has entered various new markets which include Brazil, Ecuador, Greece, Iceland and Argentina.

CHAPTER 4

DATA ANALYSIS & INTERPRETATION

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

In the present study, an attempt has been made to study and analyze the inventory system followed at NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED and to give suggestions for introduction of inventory control techniques. For this purpose the following areas of analysis were included.

4.1. INVENTORY SYSTEM FOLLOWED AT NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED

Layout of the store

The layout of the storehouse as adopted by the company offers an opportunity to the storekeeper for an efficient storekeeping. It ensures free movement of materials, timely inspection and day-to-day verification of the receipts and issues and proper arrangement of store room equipment, proper indexing for easy accessibility, maximum utilization of available space and recording the inspections are the essentials took cared of.

Methods of storing adopted by the company

The materials are placed in bins, racks and shelves depending upon the size and nature of the items. The bins, racks and shelves are so designed to suit the components of storage.

Purchase procedure

The end user department prepares an indent and places to the purchase department, stating the items needed, their quantity and quality. The purchase department will ascertain the stock-in-hand, funds available, Quantity of materials needed. A copy of indent is also sent to the finance department.

Enquiry will be sent to the Suppliers. Quotations received are compared with price, quality, reliability of suppliers, etc. The quotation, which offers the best, is selected. The company mostly deals with their reputed long-standing suppliers.

The order is placed with the supplier. On receipt of the order, the inspection procedure takes place. The department receives the materials ordered, checks it and sends it to the quality control department, where the quality of materials is inspected and sends back to stores. The stores manager also prepares a goods received note (GRN) on receiving the correct materials. The inventory maintained at the stores includes Raw material, Work in process, Finished Goods and Spares.

Valuation of inventories

The company follows significant accounting policies in valuation of its inventories. Inventories are valued at lower of cost and net realizable value. Cost is arrived at on weighted average basis. Cost includes taxes, duties, and freight. In the case of work in process and finished goods, cost further includes direct labour, overheads, and excise duty. The company follows a yearly stock taking procedure at its main stores as well as at all its factories at the year ending. Such information is recorded on a document called the bin card.

Annual inventory physical verification

The company carries out an annual physical verification of all its inventories. Physical verification is carried out in a standard format as indicated. All the factories, departments, packing sections, contract units, service departments, welfare etc., are requested to prepare well in advance, arrange and keep all its inventories ready for physical verification.

After completion of the check, the various units are requested to prepare an inventory statement with discrepancy in triplicate as per a standard format which is enclosed below.

INVENTORY STATEMENT FORMAT:

Date of check:

Area:

Classification:

Machinery:

SL NO	INVENTORY CODE	DESCRIPTION WITH MOTOR R.P.M.	TYPE H.P.	CONDITION	LOCATION
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AS PHYSICAL VERIFICATION	PER INVENTORY REGISTER	AS PER INVENTORY REGISTER	PER	EXCESS	SHORT	REASON FOR DISCREPANCY	ACTION TO BE TAKEN FOR DISCREPANCY
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This inventory statement after completion is sent to the accounts department in duplicate. The respective senior executive has to sign the statement along with the counter signature of the clerk who does the verification and the respective section clerk.

The contract units situated outside/inside the factory area is also covered by the same team under the respective department head's direction and guidance. During this verification none of the inventory items should be moved from one premise to the other unless the Managing Director or the Director- Production gives special approval. The physical verification is carried out by the concerned without affecting the normal production in the units.

The team sent for physical verification comprises the employees of the administrative office. Because of this additional job of verification, the employees' regular work is disturbed. Therefore the company has to take measures so that none of the regular work is affected.

4.2. OPERATING EFFICIENCY ANALYSIS

Ratio analysis is one of the techniques of financial analysis where ratios are used as a yardstick for evaluating the financial condition and performance of a firm. A financial ratio is the relationship between two accounting figures expressed mathematically. It is with the help of ratios that the financial statements can be analyzed more clearly and decisions are made from such analysis.

Steps involved in Ratio Analysis:

The following are the four steps involving in Ratio Analysis:

- Selection of relevant data from the financial statement depending upon the objectives of analysis
- Calculation of appropriate ratios
- Comparison of the calculated ratios with the ratios of the same firm in the past
- Interpretation of the ratios.

The present chapter aims at analyzing the operational performance of the Inventory Management at Needle Industries (India) Private Limited, The Nilgiris, by using the Ratio analysis for the period of 5 years (2002-2007).

4.2.1. Inventory Turnover Ratio

Inventory turnover indicates the efficiency of the firm in producing and selling its product. It is calculated by dividing the cost of goods sold by its average inventory. The average inventory is the average of opening and closing balances of inventory. In a manufacturing company inventory of finished goods is used to calculate inventory turnover.

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

TABLE NO- 4.2.1.
TABLE SHOWING THE INVENTORY TURNOVER RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Cost of goods sold	2,71,864,536	2,93,338,733	3,28,259,886	4,32,296,493	3,78,793,425
Average Inventory	1,12,255,377	1,24,476,327	1,42,891,122	1,56,211,708	1,75,593,508
Inventory Turnover Ratio (In times)	2.42	2.36	2.30	2.77	2.16
Inventory Conversion Period (In days)	149	153	157	130	167

Source: Annual Reports

Interpretation

A higher ratio indicates minimum lock up of funds due to effective sales because of more frequent conversion of stock into sales. A lower ratio denotes lesser sales due to poor Inventory management. The above analysis reveals that the company was able to Turnover its inventory at 2.77 times in 2005-2006, 2.42 times in 2002-2003, 2.36 times in 2003-2004, 2.30 times in 2004-2005 and 2.16 times in 2006-2007 respectively to convert its inventory into sales. The company takes around 130 days to convert its inventory to sales in 2005-2006, 149 days in 2002-2003, 153 days in 2003-2004, 157 days in 2004-2005 and 167 days in 2006-2007 respectively.

Inference

It is indicative from the above analysis that the company best managed its inventory in the year 2006-2007 as its inventory turnover ratio was the highest (i.e.) 2.77 times and the inventory conversion period was only 130 days.

CHART NO- 4.2.1.

CHART SHOWING THE INVENTORY TURNOVER RATIO



4.2.2 Raw Material Inventory Turnover Ratio

Raw material-inventory turnover ratio shows the efficiency with which the investments in raw materials are turned over by the firm. It can be calculated by comparing the cost of raw material used and average raw material inventory.

$$\text{Raw Material Inventory Turnover} = \frac{\text{Material Consumed}}{\text{Average Raw Material Used}}$$

TABLE NO- 4.2.2.

TABLE SHOWING THE RAW MATERIAL INVENTORY RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Material consumed	83,872,363	1,07,639,224	1,04,354,889	1,58,004,338	1,30,049,038
Average raw materials inventory	23,766,387	27,809,178	33,380,957	34,615,458	38,398,582
Raw materials Turnover Ratio (In times)	3.53	3.87	3.13	4.56	3.39
Average holding Period (In days)	102	93	115	79	106

Source: Annual Reports

Interpretation

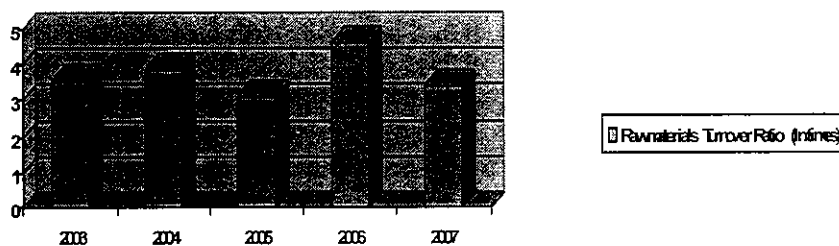
The above analysis reveals that the raw material inventory turnover ratio was the maximum during the year 2005-2006 i.e. 4.56 times, with a holding period of 79 days and was minimum during the year 2004-2005 i.e. 3.13 times with the holding period of 115 days. The raw material turnover ratio was 3.87 times with a holding period of 93 days during the year 2003-2004, 3.53 times with a holding period of 102 days in 2002-2003 and 3.39 times with a holding period of 106 days in the year 2006-2007.

Inference

The above analysis reveals that the Raw materials Turnover ratio was the maximum in the year 2005-2006 where it was 4.56 times with a minimum holding period of 79 days.

CHART NO- 4.2.2.

CHART SHOWING THE RAW MATERIAL TURNOVER RATIO



4.2.3. Finished Goods Inventory Turnover Ratio

The finished goods Inventory ratio indicates the efficiency of the firm in converting the finished goods into sales. The finished goods inventory turnover ratio can be calculated by comparing cost of goods sold and average finished goods inventory. The ratio for 5 years is shown below:

$$\text{Finished Goods Inventory Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average finished goods inventory}}$$

TABLE NO- 4.2.3.

TABLE SHOWING THE FINISHED GOODS INVENTORY RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Cost of goods sold	2,71,864,536	2,93,338,733	3,28,259,886	4,32,296,493	3,78,793,425
Average finished goods inventory	23,909,161	28,498,320	37,114,534	40,525,170	38,613,457
Finished goods inventory Turnover Ratio (In times)	11.37	10.29	8.84	10.67	9.81
Holding period (In days)	32	35	41	34	37

Source: Annual Reports

Interpretation

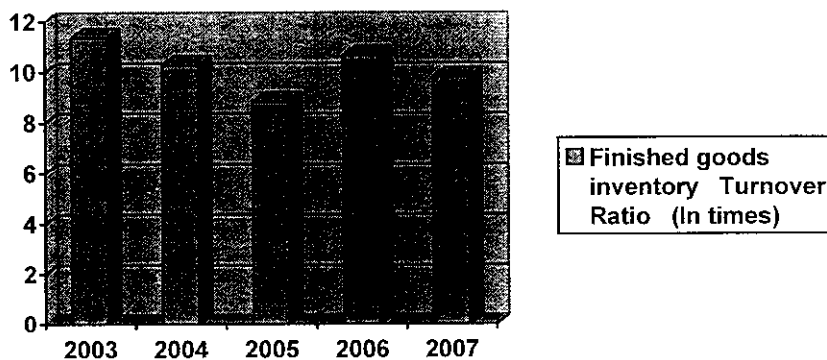
The above analysis reveals that the finished goods inventory turnover ratio was the maximum during the year 2002-2003 i.e. 11.37 times, with a holding period of 32 days and was minimum during the year 2004-2005 i.e. 8.84 times with the holding period of 41 days. The finished goods turnover ratio was 10.67 times with a holding period of 34 days during the year 2005-2006, 10.29 times with a holding period of 35 days in 2003-2004 and 9.81 times with a holding period of 37 days in the year 2006-2007.

Inference

The above analysis reveals that the Finished goods turnover ratio was the maximum in the year 2002-2003 where it was 11.37 times with a minimum holding period of 32 days.

CHART NO- 4.2.3.

CHART SHOWING THE FINISHED GOODS TURNOVER RATIO



2.4. Raw materials to Current Assets Ratio

The raw material to current assets ratio indicates the share of raw material value in the current assets. The ratio can be calculated by raw material inventory with current assets. The ratios for 5 years are as follows:

$$\text{Raw Material to Current Assets Ratio} = \frac{\text{Raw Material Inventory}}{\text{Current Assets}}$$

TABLE NO- 4.2.4.

TABLE SHOWING THE RAW MATERIAL TO CURRENT ASSETS RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Raw material at the end	24,172,200	31,446,155	35,315,759	33,915,156	42,882,006
Current Assets	2,29,529,747	2,86,100,170	3,82,299,839	4,32,836,253	3,95,610,239
Ratio in Percentage	10.53%	10.99%	9.24%	7.84%	10.84%

Source: Annual Reports

Interpretation

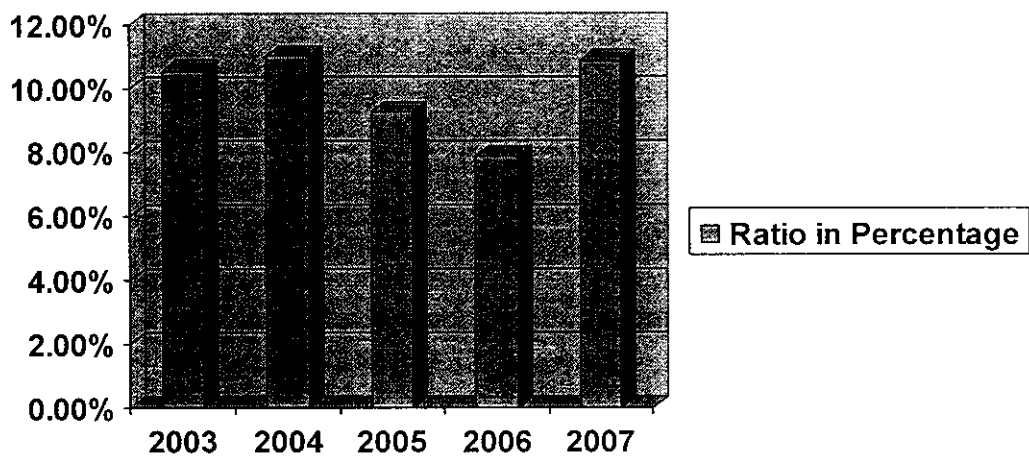
Higher ratio indicates maintenance of sufficient raw materials by the company and a lower ratio indicates lower level of raw materials held by the company. The above analysis indicates that the raw material to current assets ratio form 10.99% in the year 2003-2004, 10.84% in the year 2006-2007, 10.53% in 2002-2003, 9.24% in 2004-2005, and 7.84% in the year 2005-2006 respectively.

Inference

The raw material to current assets ratio is the maximum during the year 2003-2004 where the raw materials form 10.99% of the current assets. On an average the company maintains sufficient level of raw materials as a part of its current assets.

CHART NO- 4.2.4.

CHART SHOWING THE RAW MATERIAL TO CURRENT ASSETS RATIO



4.2.5 Finished Goods to Current Assets Ratio

The finished goods to current assets ratio indicates the amount of contribution of finished goods to current assets investment. The ratio can be calculated by comparing finished goods inventory with current assets. The ratios for 5 years are follows:

$$\text{Finished Goods To Current Assets Ratio} = \frac{\text{Finished Goods}}{\text{Current Assets}}$$

TABLE NO- 4.2.5.

TABLE SHOWING THE FINISHED GOODS TO CURRENT ASSETS RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Finished goods inventory	26,554,625	30,442,014	43,787,054	37,263,285	39,963,628
Current Assets	2,29,529,747	2,86,100,170	3,82,299,839	4,32,836,253	3,95,610,239
Ratio in Percentage	11.57%	10.64%	11.45%	8.61%	10.10%

Source: Annual Reports

Interpretation

Lower finished goods to current assets ratio implies speedy sales and less accumulation of unsold goods by the company and a higher ratio indicates higher level of unsold finished goods held by the company. The above analysis indicates that the

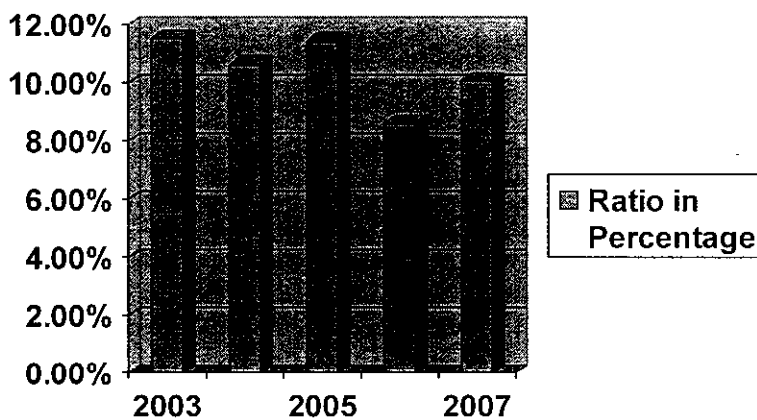
finished goods to current assets ratio form 8.61% in the year 2005-2006, 10.10% in the year 2006-2007, 10.64% in 2003-2004, 11.45% in 2004-2005, and 11.57% in the year 2002-2003 respectively.

Inference

The finished goods to current assets ratio was the minimum during the year 2005-2006 where the finished goods contributed to only 8.61% of the current assets. On an average the company regulates speedy sales and less accumulation of unsold finished goods.

CHART NO- 4.2.5.

CHART SHOWING THE FINISHED GOODS TO CURRENT ASSETS RATIO



4.2.6 Inventory to total assets ratio

This ratio indicates the proportion of Inventory that constitutes total assets. A higher ratio indicates that the firm has unnecessary look up of funds. A lower ratio indicates better position of the firm. It was obtained by comparing Average Inventory with Total assets.

$$\text{Inventory to total assets ratio} = \frac{\text{Average Inventory}}{\text{Total Assets}}$$

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TABLE NO- 4.2.6.

TABLE SHOWING THE INVENTORY TO TOTAL ASSETS RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Average inventory	1,12,255,377	1,24,476,327	1,42,891,122	1,56,211,708	1,75,593,508
Total Assets	3,45,412,753	4,07,686,589	5,77,052,802	6,36,994,800	6,21,692,561
Percentage of Inventory to Total Assets	32.50%	30.53%	24.76%	24.52%	28.24%

Source: Annual Reports

Interpretation

The above analysis reveals that the current assets form a major part of the total assets of the company. The current assets form 32.50% of the total assets during the

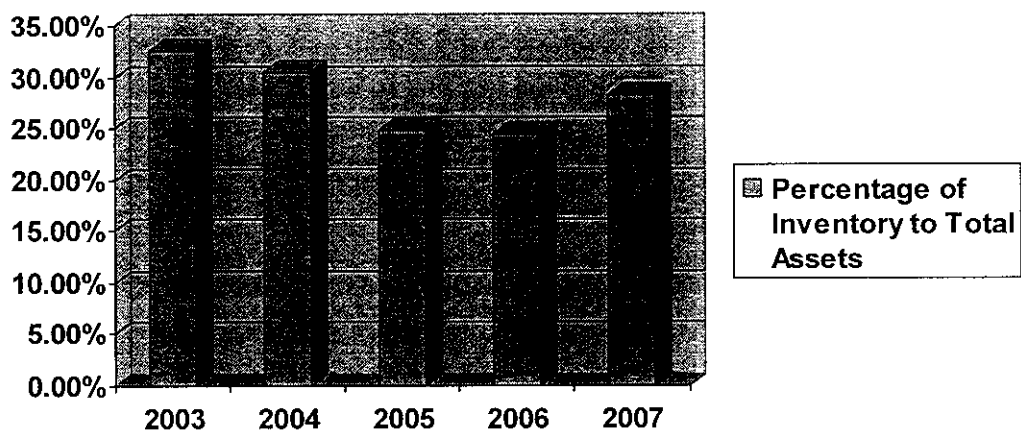
year 2002-2003, 30.53% in the year 2003-2004, 28.24% in 2006-2007, 24.76% in 2004-2005 and 24.52% in 2005-2006 respectively.

Inference

In the year 2002-2003, 32.50% of the total assets were found to be the current assets, which were found to be the maximum during the period of study.

CHART NO- 4.2.6.

CHART SHOWING THE INVENTORY TO CURRENT ASSETS RATIO



4.2.7 Debtors to Current Assets Ratio

This ratio indicates the proportion of debtors constituting Current assets. A lower ratio reduces the chances of bad debts. A higher ratio increases the chances of bad debts. It was obtained by comparing the Average Debtors with current assets.

$$\text{Debtors to Current Assets Ratio} = \frac{\text{Average Debtors}}{\text{Current Assets}}$$

TABLE NO- 4.2.7.

TABLE SHOWING THE DEBTORS TO CURRENT ASSETS RATIO

(Value in Rupees)

Particulars	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Average Debtors	47,742,777	38,107,241	40,927,850	51,453,532	39,020,892
Current Assets	2,29,529,747	2,86,100,170	3,82,299,839	4,32,836,253	3,95,610,239
Percentage of Debtors to Current Assets	20.80%	13.32%	10.71%	11.89%	9.86%

Source: Annual Reports

Interpretation

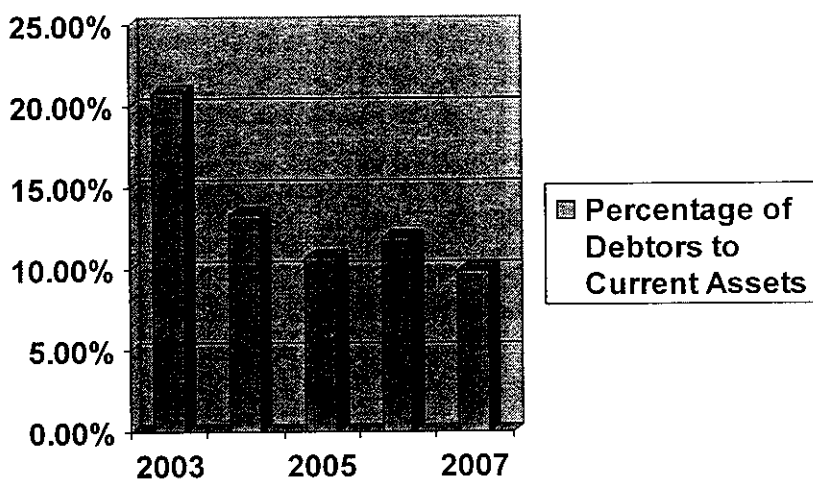
A lower debtor to current assets ratio implies speedy payment to the debtors of the company and a higher ratio indicates delayed payment to the suppliers of the company. The above analysis indicates that the debtors to current assets ratio is 9.86% in the year 2006-2007, 10.71% in the year 2004-2005, 11.89% in 2005-2006, 13.32% in 2003-2004, and 20.80% in the year 2002-2003 respectively.

Inference

The debtors to current assets ratio was the minimum during the year 2006-2007 where the debtors contributed to only 9.86% of the current assets. It is clear from the analysis that the company has been constantly trying to decrease its debtors level over the years.

CHART NO- 4.2.7.

CHART SHOWING THE DEBTORS TO CURRENT ASSETS RATIO



4.3. NET OPERATING CYCLE

The time that elapses between the purchase of raw materials and the collection of cash for sales is referred to as gross operating cycle. The time length between the payment of raw materials, purchases and the collection of cash for sales is referred to as the Cash conversion cycle or the Net operating cycle. From the financial statements of the firm, the Inventory period, the Accounts receivable period and the Accounts payable period can be estimated. Gross Operating Cycle is the sum of Inventory Conversion Period and the Debtors Conversion Period. The Inventory Conversion Period is the sum of Raw material Conversion period WIP Conversion Period and finished goods Conversion period. The Net Operating Cycle is the difference between the Gross Operating Cycle and the Payables Deferral Period.

NET OPERATING CYCLE = GROSS OPERATING CYCLE + CREDITORS DEFERRED PERIOD, where,

$$\text{Gross Operating Cycle} = \text{RMCP} + \text{WIPCP} + \text{FGCP} + \text{DCP}$$

TABLE NO- 4.3.1.
TABLE SHOWING THE NET OPERATING CYCLE

The following table shows the Net Operating Cycle in days during the study period- 2002-2007:

PARTICULARS	2006- 2007	2005- 2006	2004- 2005	2003- 2004	2002- 2003	Average
Raw Material Conversion Period(RMCP)	119	77	122	105	104	105
WIP Conversion Period (WIPCP)	29	19	28	38	47	32
Finished Goods Conversion Period(FGCP)	35	29	48	37	35	37
Inventory conversion Period(ICP)	183	125	198	180	186	174
Debtors Conversion Period(DCP)	22	22	22	22	35	25
Gross Operating Cycle(GOC)	205	147	220	202	221	199
Creditors Deferral Period(CDP)	7	15	28	11	12	15
Net Operating Cycle(NOC)	198	132	192	191	209	184

Source: Annual Reports, Company Schedule, Raw material Consumption Statement.

Interpretation

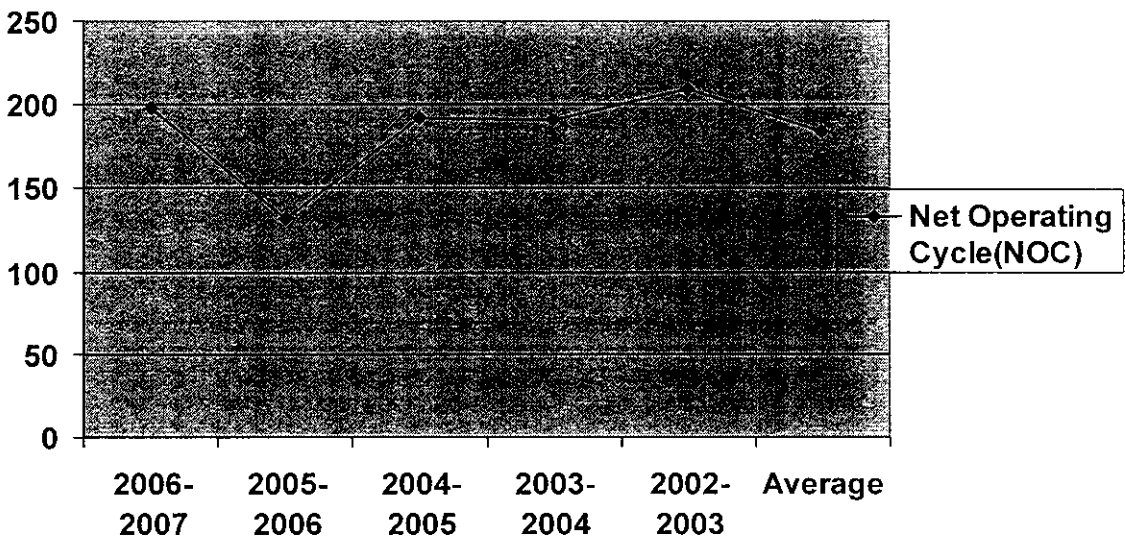
The above table shows that on an average the raw material conversion period is 105 days, the work-in-process conversion period is 32 days, the finished goods conversion period is 37 days, the inventory conversion period is 174 days, the debtors

conversion period is 25 days, the creditors deferral period is 15 days and the Net Operating Period is 184 days which shows an average rate of speedy conversion of inventory to Sales. As the Payments deferral period is greater than the Book debts conversion period it helps the company in increasing the liquid position of the company.

Inference

The company has been most successful in converting its inventory into sales at the earliest during the year 2003-2004 as the net operating period was the minimum (i.e.) it took the company only around 132 days.

CHART NO- 4.3.1
CHART SHOWING THE NET OPERATING CYCLE



4.4. ABC (ALWAYS BETTER CONTROL) ANALYSIS

The materials are divided into a number of categories for adopting a selective approach for material control. It is generally seen that in manufacturing concern, a small percentage of items contribute a higher percentage of value while, higher percentage of items contribute small percentage of value. In between these two limits there are some items, which have almost equal percentage of value of materials. Under A B C analysis, the materials are divided into three categories viz., A, B and C.

Theory:

This analysis is based upon Pareto Principle according to which in many situations, majority of the activity (70 to 80%) is governed by very few (10 to 20) attributes.

- I. If all the stock materials are analyzed in terms of their annual consumption value, major part of total consumption value on a Railway (about 70-80%) is of only few high consumption value materials (say 10 to 20%). These materials may be classified as A-category. That is few major items that tie-up most inventory value.
- II. 15 to 20% of total consumption is represented by another 15 to 20% materials which may be classified as B-category.
- III. Remaining 5 to 10% consumption is represented by a large number of small consumption value materials which may be classified as C-category.

Procedure of ABC Analysis

1. First of all annual issue values of all the materials which were issued from the stores are added together to find total issues
2. Then all the materials are arranged in descending sequence of their issue value.
3. Then we go on counting the materials adding issue value of the materials to a 'cumulative issue value' counter. When the value in this counter represents 75% of total issue- value

worked out in step-1, after reading a particular materials, all the items from top to this item are classified as 'A' category materials.

4. The reading of materials is further continued when after reading a particular materials and adding its issue value to 'cumulative issue value' counter, value in the counter is equal to 95% of total issues, we mark all materials from item next to last A category item to this item as B category materials.
5. All remaining materials are classified as C category materials.

For the purpose of Inventory Control, A category materials are most important. Therefore, they are closely monitored at highest level at very frequent intervals.

The present chapter aims at classifying items for NEEDLE INDUSTRIES (INDIA) PRIVATE LIMITED, THE NILGIRIS, based on annual consumption values for the year 2007-2008.

TABLE NO- 4.4.1.

MASTER TABLE SHOWING THE ABC CLASSIFICATION OF THE RAW MATERIALS

MATERIALS		A	B	C
NUMBER OF ITEMS		3	5	10
LIST OF ITEMS	1	ALUMINIUM ROD/SHEET	STAINLESS STEEL WIRE	STYRON
	2	BRASS STRIP	BRASS WIRE	HIGH TENSILE STEEL WIRE
	3	HIGH CARBON STEEL WIRE	PHOSPHER BRONZE WIRE	BLISTER FILM
	4		STEEL STRIP	POLYPROPYLENE NATURAL
	5		ABS RESIN TRANSPARENT	STAINLESS STEEL WIRE 304 GRADE
	6			MASTER BATCH
	7			MASTER BATCH HIPS
	8			POLYTHENE 428C
	9			GLASS ROD
	10			DELIRIN
PERCENTAGE OF MATERIALS		16.67%	27.78%	55.55%
PERCENTAGE OF VALUE CONSUMED		69.92%	24.72%	5.36%

Source: Issue Analysis, Value Ledger

Interpretation

About 16.67% of total number of items contributes to 69.92% of total consumable value. It constitutes the A –Class items of the raw materials at Needle Industries. About 27.78% of the total number of items contributes to 24.72% of the total consumption value. It constitutes the B-Class items of raw materials. About 55.55% of

the total number of items contributes to 5.36% of the total consumption value. It constitutes C-class item of the total raw materials.

CHART NO- 4.4.1.

CHART SHOWING THE ABC CLASSIFICATION OF RAW MATERIALS

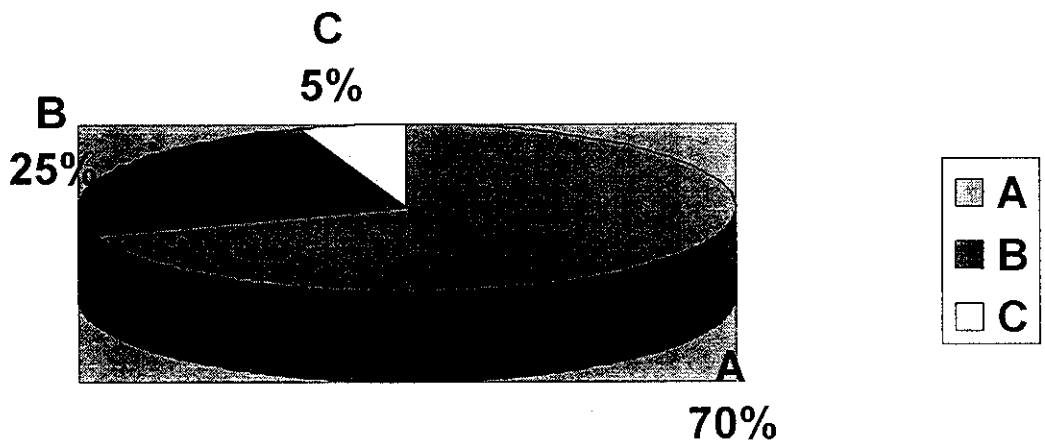


TABLE NO- 4.4.2.
MASTER TABLE SHOWING THE ABC CLASSIFICATION OF THE PRIMARY
PROCESS MATERIALS

MATERIALS	A	B	C
NUMBER OF ITEMS	6	25	34
LIST OF ITEMS	1		
	NICKEL STRIP	NICKEL SULPHATE	INITIAL BRIGHTNER
	2	NICKEL CHLORIDE	NICKEL ADDICTIVE 22
	3	GOLD 22CT EXPORT	KEROSENE
	4	MICRO DRILLS	NORCAM LUSTRE COMPOUND
	5	CANVAS JUTE	ILOQUENCH NO.1
	6	ACID PHOSPHORIC	H.C.H.C.R. ROUND
	7		SOFT SOAP
	8		ZINC ANODE
	9		TRICHLOROETHYLENE
	10		SODA ASH
	11		CANVAS WHITE
	12		MACHINE MOPS
	13		HIQUENCH M OIL
	14		THINNER
	15		POINT TURNING CUTTER
	16		G.W.
	17		SPECTRA BRIGHTNER
	18		BAMBOO DUST
	19		AIR FLOW MOPS
	20		COOLEGE SL
	21		ACID BORIC
	22		BUTYL ACETATE
	23		SCOURING CORD
	24		ZINCALITE CLZ
	25		BRASS ACTIVATOR
	26		ACETIC ACID
	27		COLOUR HEADS
	28		QUARTZ MESH
	29		CLEAR DUCO LACQUER
	30		ACID HYDROCHLORIC
	31		GIBONAL C
	32		H.C.H.C.S. ROUND
	33		POINTING STONE
	34		CREAM OF TARTAR
	35		ACID NITRIC
	36		BITUMENOUS COMPOUND
	37		BRASS WIRE WHEEL
	38		SAFEKLEEN MAINTANANCE BRIGHTNER
	39		ILOFORM

23		HDA CLEANER	AQUAGUARD 305
24		STEELEX K 20	ZINTHOBRITE
25		FLAKE SOAP	AL BLACK PAINT
26			PERFECTO 100
27			HARDENING PANS
28			ACID SULPHURIC
29			HARDENING PANS LIDS
30			ENVISION PLUS BRIGHTNER
31			GICTANE
32			LIME POWDER
33			TRICHROME
34			PIGMENT BLACK
PERCENTAGE OF MATERIALS	9.23%	38.46%	52.31%
PERCENTAGE OF VALUE CONSUMED	72.19%	23.63%	4.18%

Source: Issue Analysis, Value Ledger

Interpretation

About 9.23% of total number of items contributes to 72.19% of total consumable value. It constitutes the A –Class items of the primary process materials at Needle Industries. About 38.46% of the total number of items contributes to 23.63% of the total consumption value. It constitutes the B-Class items of primary process materials. About 52.31% of the total number of items contributes to 4.18% of the total consumption value. It constitutes the C-class item of the total primary process materials.

CHART NO- 4.4.2.
CHART SHOWING THE ABC CLASSIFICATION OF THE PRIMARY
PROCESS MATERIALS

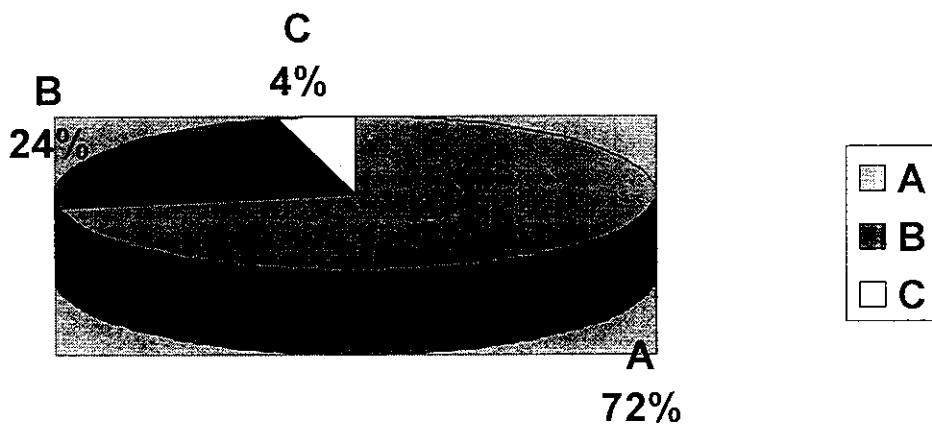


TABLE NO- 4.4.3.
MASTER TABLE SHOWING THE ABC CLASSIFICATION OF THE
SECONDARY PROCESS MATERIALS

MATERIALS	A	B	C
NUMBER OF ITEMS	4	21	33
LIST OF ITEMS			
1	DECOLOURANT	LPG GAS CYLINDER	METHYL ACETATE
2	METSTRIP S	PERFECTO	NITROGEN GAS CYLINDER
3	SAFEKLEEN	SODIUM BISULPHATE	THINNER
4	ACID PHOSPHORIC	ALPHA ZN	ILOTEMP
5		POLYELECTROLYTE	CLEAR DUCCO LACQUER
6		ACID SULPHURIC	COOLEEDGE SL
7		LABOLENE	SODIUM FLUORIDE
8		HUNTINGTON CUTTER	SODIUM ACETATE TRIHYDRATE
9		TRISODIUM CITRATE	SILVER NITRATE
10		TEEPOL	SODIUM METASILICATE
11		POTASSIUM CYANIDE	SODIUM CARBONATE
12		SODA ASH	ROSIN
13		SILICON SPRAY	ACTIVATED CARBON
14		H.D.EMULSION	PICKLANE
15		ACID HYDROCHLORIC	AMMONIUM SOLUTION
16		CAUSTIC SODA	ETHANOL LR
17		LD BAG	ACETONE
18		KEROSENE	ACID NITRIC
19		EXTRAN MA01	ANODISING DYES
20		HYDROGEN PEROXIDE	SODIUM CHLORIDE
21		STEELEX K	POTASSIUM DICHROMATE
22			SODIUM NITRITE

23			AMMONIUM ACETATE
24			GROUNDNUT OIL
25			INK
26			DISODIUM HYDROGEN
27			QUARTZ RANDOM MEDIA
28			VCI PAPER
29			SODIUM HYDROXIDE AMPOULES
30			COTTON WASTE
31			GREASE
32			UNIVERSAL INDICATOR
33			BARIUM CHLORIDE
PERCENTAGE OF MATERIALS	6.90%	36.21%	56.90%
PERCENTAGE OF VALUE CONSUMED	71.79%	24.10%	4.11%

Source: Issue Analysis, Value Ledger

Interpretation

About 6.90% of total number of items contributes to 71.79% of total consumable value. It constitutes the A –Class items of the secondary process materials at Needle Industries. About 36.21% of the total number of items contributes to 24.10% of the total consumption value. It constitutes the B-Class items of secondary process materials. About 56.90% of the total number of items contributes to 4.11% of the total consumption value. It constitutes the C-class item of the total secondary process materials.

CHART NO- 4.4.3.

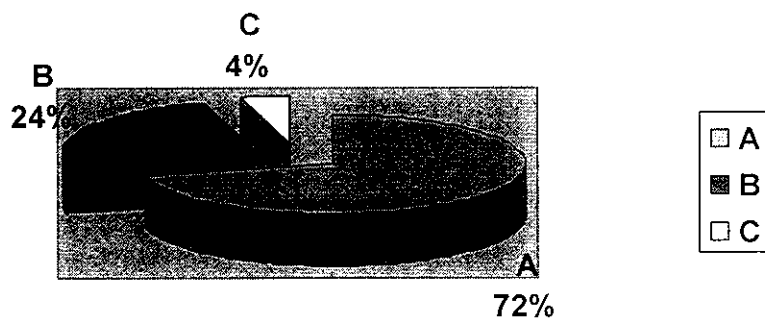
CHART SHOWING THE ABC CLASSIFICATION OF THE SECONDARY
PROCESS MATERIALS

TABLE NO- 4.4.4.
MASTER TABLE SHOWING THE ABC CLASSIFICATION OF THE PACKING MATERIALS

MATERIALS	A	B	C
NUMBER OF ITEMS	8	11	14
LIST OF ITEMS			
1	CARDS	EMBROIDERY THREADS	PLASTIC PACKS
2	CTN O&G	CTN EF	CTN
3	FOLDERS	POUCHES	NYLON MONOFILAMENT
4	LABELLED PAPER	PP BAG	BALL BEARING
5	MISC	KNOBS & GAUGE	CLEAR POLYSTER FILM
6	CTN 5 PLY	CTN 3 PLY	E'FLUTE
7	LAMINATE	BLISTER PACKS	LABELS
8	CTN WT	TVS SEWING MACHINE NEEDLES	BANIAN WASTES
9		BOPP TAPE/FILM	CLEAR RIGID FILM
10		STICKERS	ENVELOPES
11		INKS	SURGEON GLOVES
12			LEATHER BELTS & FIBRE GLASS TAPE
13			TAGS
14			EMERY PAPER
PERCENTAGE OF MATERIALS	24.24%	33.33%	42.43%
PERCENTAGE OF VALUE CONSUMED	74.64%	21.32%	4.05%

Source: Issue Analysis, Value Ledger

Interpretation

About 24.24% of total number of items contributes to 74.64% of total consumable value. It constitutes the A -Class items of the packing materials at Needle Industries. About 33.33% of the total number of items contributes to 21.32% of the total consumption value. It constitutes the B-Class items of the packing materials. About 42.43% of the total number of items contributes to 4.05% of the total consumption value. It constitutes the C-class item of the total packing materials.

MATERIALS



4.5. VED ANALYSIS

VED- Vital, Essential, and Desirable- Analysis is used primarily for control of spare parts. The spare parts can be divided into three categories- vital, essential, or desirable- keeping in view the criticality to production. Such spares may not receive the attention they deserve if they are maintained according to ABC analysis because their value of consumption is small. So, in their cases, VED analysis is made to get the effective results. This analysis is done in the same way as the ABC analysis.

Vital items are kept in stock in sufficient quantity to ensure uninterrupted operation of the plant. They are vital because their non-availability at the required time may cause stoppage of production. Essential items are also kept in stock in adequate quantity. However the firm may take a reasonable risk as regards these types of items. Desirable items are those which are readily available in the market and hence the firm may not keep these items in stock except to provide for the lead time.

VED classification can be done in consultation with the department because they know their items better. For this study an extensive consultation has been made with all the departments and according to their feedback and the annual consumption the items are classified as Vital, Essential, Desirable categories.

TABLE NO- 4.5.1.
MASTER TABLE SHOWING THE VED ANALYSIS OF THE STORES AND SPARES

MATERIALS		V	E	D
NUMBER OF ITEMS		7	18	42
LIST OF ITEMS	1	SPARES- LOWER DIES	OMRON TIMER	FEED WHEEL
	2	BEARTEX WHEELS	VULCANISED FIBRE SHEET	BRASS FLAT
	3	CARBIBE 'V' BLOCKS	M.S.FLAT/ROUND	SILICON SPRAY
	4	O.H.N.S.S.	SILVER STEEL ROUND	ALUMINIUM SQUARE
	5	BALL BEARING	COPPER ROD	BRICK FLOOR
	6	TITANIUM HAIR PIN HEATER	H.C.H.C.S FLAT	POINT TURNING CUTTER 'PP'
	7	BRAMMER V-LINK BELTING	P.B.ROUND	LIMIT SWITCH
	8		SWITCH FUSE AMPS	FEVIBOND/M-SEAL
	9		HOSE CLAMP	BEARING SLEEVE
	10		SPRING STEEL STRIP	M.S.HEX NUT
	11		WELDING ELECTRODE	BRICK COURSE
	12		FLUID SEAL	EMERY PAPER
	13		HEX HEAD BOLT	G.M.GATE/WHEEL VALVE
	14		ALLEN SCREW	CANVAS BELT
	15		HUNTINGTON CUTTER O	P.P.BALL VALVE
	16		THERMOCOUPLE	M.S.PLATE WASHER
	17		DIODE	USED HDPE BAGS
	18		METAL BONDED RUBBER STATOR	PVC
	19			BOBBING GREASE
	20			NOZZEL HEATER
	21			HSS HAND HACKSAW BLADE
	22			CHEESE HEAD SCREW

23			FLOAT SWITCH
24			ENDLESS VEE BELT
25			BRASS CSK MACHINE SCREW
26			GRUP SCREW
27			JUTE TWINE
28			SYNTHETIC RUBBER SHEET
29			G.I.BEND/NIPPLE/PLUG
30			CHAIN ROLLER
31			WIRE NAILS
32			ARALDITE
33			BRASS HEX SCREW
34			PIN TACKS
35			GASKET SHELLAC
36			G.I.UNION
37			OIL SEAL
38			TEFLON TAPE
39			CONNECT LINK
40			BRASS WASHER
41			SPRING WASHER
42			WOOD SCREW
PERCENTAGE OF MATERIALS	10.45%	26.87%	62.68%
PERCENTAGE OF VALUE CONSUMED	75.60%	20.04%	4.36%

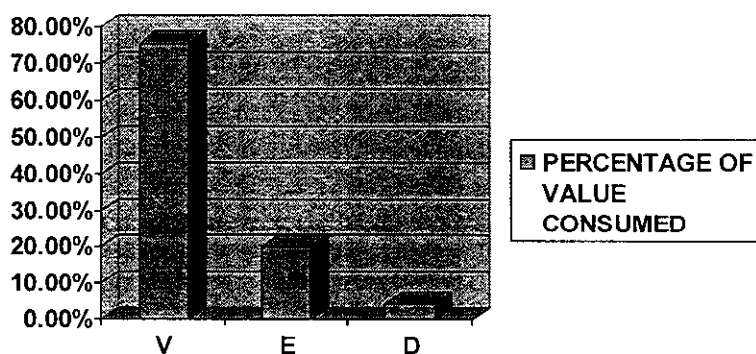
Source: Issue Analysis, Value Ledger

Interpretation

The spare items whose stock out for short time will stop production for quite some time and where the cost of stock out is very high is known as vital items. In the above analysis it was found that 10.45% of total number of items falls under 'V' category. These items should be subjected to scrutiny at higher levels in the organization. The absence of spare items which cannot be tolerated for more than few hours or a day and the cost of loss of introduction are high and which are essential for the production to continue are known as Essential items. The table indicates that 26.87% of total number of items falls under 'E' category. Middle level managers should control these items. The desirable items are those which are required, but the absence of even a week or so will not lead to stoppage of production. From the above table it was found that 62.68% of total number of items falls under 'D' category. These items should be under the control of lower level managers. The spares classified under 'V' category form 75.60% of the material consumed, 'E' category form 20.04% of the material consumed and the remaining 4.26% of the material consumed are classified under 'D' category.

CHART NO- 4.5.1.

CHART SHOWING THE VED ANALYSIS OF THE SPARE PARTS



4.6. ECONOMIC ORDER QUANTITY

One of the popular models developed for items of repetitive nature, future demands for which can be projected with certainty is Economic Order Quantity (EOQ) model.

This model assumes that price of the material remains constant with time and also does not vary with order quantity. This model can be developed mathematically by differentiating total cost of inventory (ordering cost + inventory carrying cost) with respect to Quantity.

Costs of Ordering

The demands received are technically scrutinized and for purchasing them, inquiries are issued, tenders are received and evaluated, orders are progressed, materials are received and inspected and lastly, the payments are arranged. All these mean additional costs to the organization. All these costs together constitute what is called cost of ordering. The cost of ordering is different for various materials. For the ease of calculation, the ordering cost is fixed for all the materials. **The average inventory ordering costs was therefore calculated on that basis and was found to be Rs.20.**

Inventory Carrying Costs

The very fact that the items are required to be kept in stock means additional expenditure to the organization.

The different elements of costs involved in holding inventory are as follows:

(a) Interest on capital / cost of capital / opportunity costs

When materials are kept in stock money representing the value of materials is blocked. In a developing economy, capital is extremely scarce and as such, the real value of capital is much higher than the nominal rate of interest. The money which is blocked up is not available to the organization to do more business or to use it for alternative

productive investment. This opportunity to earn more profits which we loose can be expressed as opportunity cost.

(b) Obsolescence and depreciation:

The costs because of obsolescence and depreciation are very important even though they are very difficult to assess. Larger the stock we keep more the risk of obsolescence and as such, the costs are expressed as the percentage costs to the average inventory holding.

(c) The cost of storage, handling and stock verification:

There are additional costs because of the clerical work involved in handling of materials in the ward, in stock verification, in preservation of materials as well as the costs because of various equipments and facilities created for the purpose of materials. This includes the cost of staff and inspection of materials for quality.

(d) Insurance Costs

Materials in stocks are either insured against theft, fire etc., or we may have to employ watch & ward organization and also fire fighting organizations. The average inventory carrying costs can, therefore, be as follows:

Exhibit Showing The Calculation of Inventory Carrying Cost

Interest/costs of capital/opportunity cost	8.35 %
Obsolescence and depreciation cost	2.4 %
Storage, handling, etc	1.4 %
Insurance costs	0.6 %
Total (Carrying Cost)	12.75 %

22	METSTRIP S	LTR	7,21,045.46	15040
23	SAFEKLEEN	LTR	4,85,584	12343
24	ACID PHOSPHORIC	KGS	2,41,627.18	8707
25	LPG GAS CYLINDER	NO	2,30,682.54	8507
26	PERFECTO	LTR	1,93,126.32	7784
27	SODIUM BISULPHATE	KGS	1,24,327.06	6245
28	ALPHA ZN	LTR	70,347.54	4698
29	POLYELECTROLYTE	KGS	58,406.4	4281
30	ACID SULPHURIC	KGS	50,279.2	3972
31	CARDS	NO	17,010,360.74	73052
32	CTN O&G	NO	5,348,354.56	40962
33	FOLDERS	NO	4,406,558.18	37181
34	LABELLED PAPER	NO	3,909,500.72	35022
35	MISC	KGS	3,589,032.14	33555
36	CTN 5 PLY	NO	2,641,903.8	28789
37	LAMINATE	KGS	2,200,197.86	26273
38	CTN WT	NO	2,158,937.78	26025
39	EMBROIDERY THREADS	SKE	1,969,983.7	24860
40	CTN EF	NO	1,952,820.54	24752
41	SPARES- LOWER DIES	NO	7,85,485.02	15698
42	BEARTEX WHEELS	NO	5,83,670.64	13532
43	CARBIBE 'V' BLOCKS	NO	1,66,599.66	7230
44	O.H.N.S.S.	KGS	1,21,926.45	6185
45	BALL BEARING	NO	1,06,491.18	5780
46	TITANIUM HAIR PIN HEATER	NO	93,445.53	5414
47	BRAMMER V-LINK BELTING	MTR	87,943.83	5253
48	OMRON TIMER	NO	64,963.92	4515
49	VULCANISED FIBRE SHEET	MTR	63,630.03	4468
50	M.S.FLAT/ROUND	KGS	59,033.88	4304

Source: Bank Stock Statement, Value Ledger

TABLE NO- 4.6.2.

TABLE SHOWING THE EOQ FREQUENCY TABLE OF THE INVENTORY

LOT SIZES	FREQUENCY	PERCENTAGE
BELOW 10000	15	30
10001-20000	5	10
20001-30000	14	28
30001-40000	5	10

Interpretation

From the Above table it is clear that 30% of the inventory's Economic Order Quantity is below 10000 units. 28 % of the inventory's EOQ is between 20001-30000 units, 14 % of the inventory's EOQ is above 50000 units, 10% of the inventory's EOQ is between 10001-20000 units and between 30001-40000 units and 8% of the inventory's EOQ is between 40001-50000 units.

each material to be ordered per order which would prove economical for the company. 30% of the Inventory's Economic Order Quantity is below 10000 units.

CHAPTER 5

CONCLUSION

handled are too many in number. Uneven lead time of the suppliers is also the cause for stock out situations.

- It is indicated that the company best managed its inventory in the year 2006-2007 as its inventory turnover ratio was the highest (i.e.) 2.77 times and the inventory conversion period was only 130 days.
- The Raw materials Turnover ratio was the maximum in the year 2005-2006 where it was 4.56 times with a minimum holding period of 79 days.
- The Finished goods turnover ratio was the maximum in the year 2002-2003 where it was 11.37 times with a minimum holding period of 32 days.
- The raw material to current assets ratio is the maximum during the year 2003-2004 where the raw materials form 10.99% of the current assets. On an average the company maintains sufficient level of raw materials as a part of its current assets.
- The finished goods to current assets ratio was the minimum during the year 2005-2006 where the finished goods contributed to only 8.61% of the current assets. On an average the company regulates speedy sales and less accumulation of unsold finished goods.
- In the year 2002-2003, 32.50% of the total assets were found to be the current assets which were found to be the maximum during the period of study.
- The debtors to current assets ratio was the minimum during the year 2006-2007 where the debtors contributed to only 9.86% of the current assets. It is clear that the company has been constantly trying to decrease its debtors level over the years.

- The company has been most successful in converting its inventory into sales at the earliest during the year 2003-2004 as the net operating period was the minimum (i.e.) it took the company only around 132 days.
- In raw materials, A class constitute about 16.67% of total number of items which contributes to 69.92% of total consumable value. B Class constitute to about 27.78% of the total number of items which contributes to 24.72% of the total consumption value and C class constitute to about 55.55% of the total number of items which contributes to 72.19% of total consumable value. B Class constitute to about 38.46% of the total number of items which contributes to 23.63% of the total consumption value and C class constitute to about 52.31% of the total number of items which contributes to 4.18% of the total consumption value.
- In secondary process materials, A class constitute about 6.90% of total number of items which contributes to 71.79% of total consumable value. B Class constitute to about 36.21% of the total number of items which contributes to 24.10% of the total consumption value and C class constitute to about 56.90% of the total number of items which contributes to 74.04% of total consumable value. B Class constitute to about 33.33% of the total number of items which contributes to 21.32% of the total consumption value and C class constitute to about 42.43% of the total number of items which contributes to 4.05% of the total consumption value.
- In spare parts, V i.e. Vital items constitute about 10.45% of total number of items which contributes to 75.60% of total consumable value. E i.e. Essential items constitute to about 26.87% of the total number of items which contributes to

20.04% of the total consumption value where the stock-out of these materials would cause heavy production down time loss. D i.e. Desirable items constitute to about 62.68% of the total number of items which contributes to 4.26% of the total consumption value.

- The economic order quantity of the high value materials was found where the quantity of material to be ordered per order was calculated. 30% of the Inventory's Economic Order Quantity is below 10000 units.

2. Suggestions

A Successful Inventory Management involves balancing the cost of inventory with the benefits of inventory. Therefore the company can use the suggestions given below to ensure Successful Inventory Management.

- The company can follow Total Quality Management (TQM) system which would require the company to adopt a computerized system of inventory management.
- The company can try to Increase the inventory turnover but should not sacrifice the service level to the customers.
- The company can order its materials based on the economic order quantity suggested which would surely be profitable for the company and will prevent unnecessary lock-up of funds.
- The suggested EOQ technique will facilitate the company to reduce the holding cost of the stocks.
- The company can use the ABC Analysis and VED Analysis to effectively control its inventory. The company can maintain a wide assortment of stock but should not spread the rapidly moving ones too thin. The stock of inventory can be kept

low but not at the cost of sacrificing service or continuity of production. The company should have adequate inventory in hand but should not get caught with obsolete items.

- The firm should always consider the costs, returns and risk factors in establishing and maintaining its inventory policy.

The degree of success in addressing these concerns is easier for a successful Inventory Management.

CONCLUSION

Inventory is a key element that impacts both the profitability and productivity of an organization. The present study focuses on the effectiveness of the existing Inventory Management System at the Needle Industries (India) Private Limited, the Nilgiris. An analytical research has been carried out by the researcher using the existing and financial records of the last 5 financial years.

The researcher classified the inventory according to its value and usage by conducting ABC Analysis and VED Analysis. The EOQ model enabled identification of economic lot sizes that could be ordered to replenish the inventory. The operating cycle analysis and ratio analysis highlighted the effectiveness of the organization in utilizing its current assets and current liabilities.

The importance of inventory control in a manufacturing company where there are multi-locational stock points and larger number of items dealt with had been well understood on observing the systems followed in the company. Added to the theoretical knowledge, the observations at the shop-floor and stores have enabled clear understanding of the system and fulfillment of aim of this project.

The study provided insights for the researcher to conclude that the Inventory Management System at the Needle Industries (India) Private Limited is found satisfactory. However, the suggestions made in the study, if implemented would perfect present Inventory Management System to be more cost efficient.

The simple fact is that firms make huge investments in inventory and the cost to carry these inventory runs from 25 to 35 percent of the inventory's worth annually. Therefore, a major goal of the firm today should be to reduce the inventory.

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The internet was also a very useful source of information with the web sites.

the sites being:

- www.ponyneedles.com
- www.search.ebscohost.com