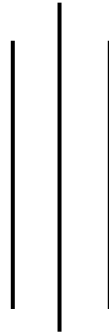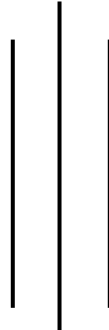# INVENTORY MANAGEMENT AND IT'S IMPACT ON PROFITABILITY OF UNILEVER NEPAL LIMITED

Submitted By

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RECOMMENDATION

This is to certify that the thesis:

Submitted by

Roj Bahadur Lama

Entitled

"Inventory management and it's impact on Profitability of Unilever Nepal Limited"

has been prepared as approved by this department in the prescribed format of faculty of management. This thesis is forwarded for examination.

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VIVA-VOCE SHEET

We have conducted the viva-voce examination of the thesis presented by

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Entitled

"Inventory management and it's impact on Profitability of Unilever Nepal Limited"

And found the thesis to be original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirements for Master Degree in Business Studies (M.B.S.)

Viva-Voce Committee

Head of Research Department ....

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I hereby declare that the work reported in this thesis entitled **"Inventory Management and its Impact on Profitability of Unilever Nepal Limited"** submitted to the Office of Dean of Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Degree of Master of Business Studies under the guidance and supervision of Mr. Prakash Singh Pradhan.

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ACKNOWLEDGEMENT

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ABBREVIATION

AIC	=	Agriculture Input Corporation
CA	=	Current Assets
DRP	=	Distribution Requirement Planning.
Co.	=	Company
EOQ	=	Economic Order Quantity
F.G.	=	Finished Goods
FIFO	=	First In First Out
FNCCI	=	Federation of Nepalese Chamber of Commerce and Industry
FY	=	Fiscal Year
HCCL	=	Himal Cement Company Limited
HCIL	=	Hetauda Cement Company Limited
HLL	=	Hindustan Level Limited
ITR	=	Inventory Turnover Ratio
JIT	=	Just-in-time
LIFO	=	Last In First Out
MRP(I)	=	Material Requirement Planning
MRP(II)	=	Manufacturing Resource Planning
PM	=	Packaging Material
R/M	=	Raw Materials
ROL	=	Re-order-Level
ROP	=	Re-order Point
Rs.	=	Rupees
UNL	=	Unilever Nepal Limited
VDC	=	Village Development Committee
WIP	=	Work-in-process

CHAPTER-I

INTRODUCTION

1.1 Background of the Study

Nepal is a least developed country of the world. It is situated at south Asia. Nepal is flanked by India and China. Three side of Nepal east, west south are boarded with India. North part of the country is boarded with China. So, it is a landlocked country of the world. The area of Nepal is only 147181 sq. km that means Nepal is also small country. But in that small area there are large differences of feature. We have world highest peak named as Mt. Everest (8848m). So Nepal also called third poll of world. We have many hills, mountains and tarai also.

Powerful river rush out of the Himalayas, beautiful temples, culture & festivals and equally exotic people really make Nepal the more beautiful nation of the world. Besides this Nepal is the Himalayan multi religion kingdom of the world, The land where Buddha burn, Sita's burn place, Aranico's nation, Mt. Everest located country are sovereign of Nepal. There are many beautiful places like as Pokhara, Lumbini, Manang, Mustang, Ilam and others. Others then we have other natural resources like water resources, mine resources, forest etc., which are helpful for industrial development.

Industrial sector is emerging as a driving force for promoting economic activities and national growth. Industrialization is a base of country's rapid economic and social progress. Now a days industrialization is considered as an essential for the economic development of the country. It facilitates effective mobilization of resource such as capital and skill of unutilized and underutilized manpower. It also acts as a vehicle for fostering innovation and technological improvement for industrial development, thus, has a multiplier effect on the economy.

In the world there are many countries whose economic condition is very high with per capita income more than $30,000 while there are such countries whose economic condition is very low with per capital income falling less then $200 per annum. The countries with low per capital income are suffering from various problems but these countries are trying to uplift their economic conditions, Nepal is one of them. After

suffering from economic and financial crisis in the past years. South Korea, Japan, Thailand, Singapore etc have recovered from the crisis and at present their economic condition is in good shape. Among the neighboring countries of Nepal China and India's economic conditions are growing very rapidly.

It is believed that in order to achieve security, stability and high standard of living the country must be industrialized, "The most important reason for embarking on a performance of industrialization is to increase the national income" (Baryle, 1969:396). The manufacturing sectors have to face various problems which have acted constraints in the growth of manufacturing industries. Such problem arises due to the country being landlocked and underdeveloped, lack of trained and skilled manpower, financial resources, inconvenience in transport and communication networks, non availability of assured energy at reasonable rate, shortage of capital, small size of the market, unawareness of the industrial potential, higher cost higher cost of production, low productivity of inputs, technology, instability in government policies etc (Pradhan, 1994:181).

Nepal is a poor developing country with per capita of about $260 per year (World Bank Report-2006). Annual economic growth rate in Nepal is about 2.2% (World Bank Report 2006). The rate must be substantially increased for the sake of rapid economic development. Due to various factors it is not developed in terms of many indicators used to measure the level of development of nation in the present day world. So it has characteristic of developing country like shortage of capital, industrial backwardness, shortage of materials, lack of technological know-how, use of low level of technology in production, under utilization of natural resources, prevalence of unemployment, low productivity, etc.

The industrialization started very late in Nepal, only after the Second World War. Industrialization is a comparatively new phenomenon in Nepal.Biratnagar jute Mill set up in 1936, marked the beginning of the organized industry in the country. After the Second World War, the shortage of essential consumer goods in the market, the promoters of these industries could reap windfall profits with a short period of time. Within a period of 10 year (1936-1946) as many as 63 industrial units were opened in the country.

In Nepalese context   both import substitution and export- promoting industries are needed. Our first attention is towards the establishment of import substitution industries. Both the import substitution industries and export-promoting industries have great importance to our economy. Import substitution industry will help to minimize the import of the goods as well as local resources such as capital, material, labor; etc will get employment within the nations. Besides these, industries will generate revenue more to the government and export promoting industries will maximize the export of good and will generate income to the nation's fund.

Industrial development in Nepal however started getting regular attention of the government under the ages of development plan after the dawn of democracy in 1951.Several industries were established in public sector mostly with the financial and technical assistance of USSR and China. The government gave much emphasis on the development of public enterprises, after the adoption of first five- year plan in 1956, the government established different public enterprises during various plan periods.

Lack of sufficient raw material of mainly unsatisfactory utilization of capacity is the failure of public sector manufacturing companies in Nepal. Due to which some of them have been liquidated, amalgamated and privatized. As the study concentrated over inventory management study followed in Unilever Nepal Ltd. It is necessary   to know exactly what is inventory. Inventory can be in most significant part of current assets of large company. Hence considerable amount of funds is required to fulfill them. It is therefore absolutely imperative to manage inventories efficiently and effectively in order to avoid unnecessary inventory. A firm neglecting the management of inventory will be loosing the long run profitability and may collapse ultimately

Inventory management is an integral part of financial management. Or it is the determination of how much inventory there should be on hand to serve for the purpose the business most economically.

1.2   An Introduction of Unilever Nepal Ltd.

This study attempts to focus on Unilever Nepal Ltd. The name was converted   form the Nepal Lever Limited into Unilever Nepal Limited on 31st December 2004 in accordance with the law enforced by passing special resolution in general meeting. Unilever Nepal ltd was formed as a subsidiary company of Hindustan lever Ltd. of India. The factory   is

situated at Basamadi VDC-5 of Makwanpur District, 6 km far from Hetauda of central development region of Nepal. The corporate office of the company is situated at Heritage plaza II, Kamaladi, Kathmandu. UNL was formed as a public limited company in 1993 and production started from December 1994 It was registered under Company Act 2053. As a growing manufacturing company, UNL has main objective of expanding the domestic business by introducing new brands and categories in the domestic market and import substitution of foreign goods too.

The company received the "Best Presented Accounts Award-2005 Runner up Category Manufacturing Sector" by the Institute of Chartered Accountants of Nepal.

UNL is taking a great corporate social responsibility. It has contributed in various ways to the social sector. UNL is proud of its role in the income and employment generation opportunities in the country. UNL is providing direct employment to over130 Nepalese citizens while generating indirect employment by over 20 times that number through its networks of suppliers, distributors and ancillaries. It is already one of the largest corporate taxpayers to Nepal Government.

It is involving in various social projects. The UNL employee Trusts mobile medical unit, which is extensively used in Makwanpur district for providing emergency medical services. The miles of healthy smiles programs, the ambitious project for contracting sector throughout Nepal to import oral health education, has covered more than 500000 children so far. The UNL is sponsoring a free clinic at Makwanpur. This clinic provides free medical treatment and medicines to needy patients. In addition the company has assisted in provision of poor, particularly the girl child, providing medical assistance in deserving cases and extended help to medical camps in and around the factory site, including donation of oral products for free distribution.

1.3   THE CORPORATE PURPOSE OF UNILEVER NEPAL LTD.

The main objective of UNL is to carry on its business of manufacturing detergent, toilet soaps, personal products, scourers, soap noodles, laundry soap, tea and vanaspati.

Other objective of Unilever Nepal Ltd is to meet the every day needs of people everywhere to anticipate the aspirations of consumers and to respond creatively and

competitively with the branded products and services, which rises up quality of life. They bring their wealth of knowledge and industrial expertise to the service of local consumers.

UNL has deep roots in local culture that the markets are unparallel inheritance thus has become foundation for the company's future growth.

For its long term success, UNL requires a total commitment to exceptional standards of performance and productivity to working together effectively and willingness to embrace new ideas and learn continuously. The company believes that the success required the highest of corporate behavior towards its employees, consumer, society and the world in which it operates. Thus UNL needs the sustainable profitable growth and long – term values creation for their shareholders and employees i.e., for their stakeholders.

1.4 OWNERSHIP OF UNILEVER NEPAL LTD.

It is a subsidiary company of foreign investment operating for technology transformation. It has an authorized capital of Rs. 30, 00, 00, 000 (Thirty crores) divided into 30, 00,000 (Thirty lakhs) ordinary shares of Rs 100 each. The issued, subscribed and paid up capital reached to the limit of Rs 9,20,70,000.00(9,20,700ordinary shares of Rs 100 each). The company is listed in Nepal Stock Exchange Center and has a positive response from its investors. The composition and percentage of sharing on capital are as follows:

Group	Allocation of shares	% of shares	No of shares
A	Hindustan Lever Ltd, India	80%	7,36,560
B	Sibkrim land and Ind. Co. (Pvt.) Ltd.	5%	46,035
C	Shares subscribed by the general public	15%	1,38,105
TOTAL		**100%**	**9,20,700**

(Source: Unilever Nepal Ltd. Annual report, 2065/66)

1.5 INTRODUCTION OF INVENTORY MANAGEMENT

The main purpose of this study is to appraise the present practice of inventory management and it's impact on profitability of Unilever Nepal Ltd.

Inventory is one of most important assets to most of the organization. Larger percentage of total capital is invested in inventory. Inventory is vital element of the firms in the efforts to achieve desire sales level. Inventory can be defined as a stock of any kind of items reserved in a store for a certain period. It constitutes the most significant portion of current assets. Inventories are stocks of finished product of a company or components that make up the product.

Inventory management involves planning of the optimum level of inventory and control of inventory cost supported by an appropriate organization structure, which is staffed by trained persons and directed by top management. It involves both financial dimension as well as physical dimension and these dimensions are interrelated and cannot be looked in isolation (Agrawal, 2002:21).

Inventory is the stock of materials or products that frequently occur in the manufacturing organization .Depending upon the nature of industry and firm, inventories may be durable and perishable, valuable and inexpensive. When materials are purchased by an organization they have to be store until they are put into the production process. When the production is over the finished products have to be stored again until they are sold. In manufacturing there are four types of inventories such as raw materials, work- in – process (semi manufactured product), finished goods and office supplies (Pandey, 1999:755).

Thus, management should pay adequate attention to the inventory management to reduce the cost of production. Inventory should be maintained in appropriate quantity so as to avoid both under stock and over stock .The aim of inventory management is to maintain optimum level of inventory for the smooth production and sales. Therefore, inventory management is primarily concerned with minimizing cost of investment in inventory maintaining desired level of inventory and minimizing total cost of inventory. Both the physical as well as financial dimension of inventory should be efficiently managed. Thus, the real task of top management lies in formulating the plan and policy that will lead to optimal inventory for the attainment of desired objectives.

Similarly inventory has direct relationship with profit planning to prepare different budgets, especially for production budget and purchase budget because

Production Units = Sales Units + Closing inventory –Opening inventory

Purchase Units= production Units + Closing inventory of raw materials – Opening inventory of raw material.

1.6 STATEMENT OF THE PROBLEM

Unilever Nepal Ltd one of the joint industry of Hindustan Lever Ltd and Nepalese people is the first industry established of its own kind Despite of the fact the return of Unilever can not be considered as satisfactory. Besides keeping in view of up roaring competition in this field Unilever Nepal Ltd needs to operate with efficiently. But till now the result is not satisfactory.

Inventory directly affects profitability of an organization. So, managing inventory in a proper way is a great challenge to every organization. I could not inventory policies in UNL by studying different journal and annual reports of the organization. Looking insight into the P\L account of UNL of different years, and it is found that profit is not increasing significantly. So this topic has been selected for research and emphasis has been given to followings points.

- How inventories are managed in Unilever Nepal Ltd.?
- How can the factory reduce inventory cost?
- What is inventory turnover ratio?
- Whether or not inventory management policy of UNL is sound?
- What would be the impact of inventory management on the profitability of the company?

1.7 OBJECTIVES OF THE STUDY

The major objective of this study is to study and analyses the existing problem underlying in inventory management of Unilever Nepal Ltd. And it's impact on profitability. In order to meet the main objective the following specific objectives have been proposed.

- To identify the present inventory position of Unilever Nepal Ltd.
- To know the relationship of sales and inventories.

- To identify the problem faced by the Unilever Nepal Ltd. In the management of inventory.
- To asses the inventories and their consequences on profitability of Unilever Nepal Ltd.
- To suggest for the better practice of inventory management.

1.8 LIMITATIONS OF THE STUDY

This study attempts to find out the problems and impact on the profitability of Unilever Nepal Ltd. Therefore the following will be the major limitation of the study.

- This study is concentrated on the area of inventory management of Unilever Nepal Ltd.
- The comprehensibility and accuracy of the study are based on the data provided by the management and various published document of UNL.
- This is the case study, so it is not applicable in general situation or all types of manufacturing enterprises.
- Unilever Nepal Ltd. produces different types of product and has diversified product groups. So this study deals with the corporate product groups namely, detergent, toilet soap, personal products, scourers, soap noodles, laundry soaps, tea and vanaspati.
- This study covers 5 years performance of Unilever Nepal Ltd.
- This study is based on data provided from companies and other available resources. Hence this study is based on secondary data was well as primary data.
- Financial tools are used in analyzing the inventory management of Unilever Nepal Ltd.

1.9 IMPORTANCE OF THE STUDY

Inventory management is one of the most important functions in an organization. Without effective and efficient inventory management, no organization can achieve its goals. A firm cannot achieve its goals unless inventories are controlled effectively and capital is allocated properly. Proper inventory management helps to increase the profit of an organization. A slight change in the cost of inventories will bring a great change in the firm's profitability. Reduction in the material cost may result in high profit.

Most of Nepalese manufacturing organizations are suffering from poor inventory management. Unilever Nepal Ltd. has different types of products thus deals with diversified product group to meet everyday need of domestic consumers. It has been producing several products since last twelve years. Being a manufacturing company, it spends a lot of time, money and effort in inventory management. Therefore, the researcher is very much interested to examine its inventory management system of UNL. So, this topic is chosen for the study. It is hoped that the study may help to solve the problem faced by Unilever Nepal Ltd. To eliminate the obstacles presently traced in inventory management.

1.10 ORGANIZATION OF THE STUDY

This study has to be completed within the format provided by the Research Department of Shanker Dev Campus, The faculty of Management, TU. So, the research is divided into five chapters, which are as follows

a. Chapter One: It includes general background of study statement of problem, objectives of the study, introduction of the company, objectives and limitations of the study.

b. Chapter Two: This chapter includes review of literature. The researcher has divided this chapter into two portions, first being theoretical framework and second is review of pervious studies.

c. Chapter Three: The chapter three includes research methodology research design, nature and sources of data, data gathering procedure, presentation and analysis of technique. Research methodology consists of research design & research tools. Both primary and secondary data are used in this study. But secondary data are used considerably.

d. Chapter Four: Fourth chapter of this study is concern with data presentation & analysis. This is the main part of the study. Obtained data are presented in the tabular & other forms. Various statistical presentations are used for analyzing the collected data from different sources. Actual results are obtained after analysis of data by using financial and statistical tools and techniques. Major findings are drawn after analysis of data.

e. Chapter Five: This is the last chapter of study & includes summary conclusion, findings and some recommendations.

CHAPTER TWO

2. REVIEW OF LITERATURE

Scientific research must be based on past knowledge. Review of literature means taking knowledge from different sources. In this chapter the researcher has reviewed various published & unpublished materials. Similarly past researcher's thesis are reviewed and also books, articles, newspaper are reviewed. The previous study should be reviewed because they provide the foundation to the present study. The review of literature provides the foundation for developing a comprehensive theoretical framework from which hypothesis can be develop some expertise in one's area, to see what new contributions can be made, and to receive some ideas for developing a research design.

There are many researches made in the field of Nepalese manufacturing enterprise. Only limited numbers of studies have been conducted in the field of inventory management. In this chapter attempts have been made to present the review of literature regarding inventory management. This chapter is divided into two sub-sections. **Conceptual Framework** (theoretical concept of inventory management) is present in first section **and review of related studies** has been in the second section.

2.1 CONCEPTUAL FRAMEWORK

2.1.1 CONCEPT OF PROFIT PLANNING AND CONTROL

The term profit planning and control is formed after contribution of three different terms profit, planning and controlling. It is an important approach, mainly in profit-oriented enterprises. Profit planning is merely a tool of management. It is not an end of management or substitute of management. It facilitates the managers to accomplish managerial goals in a systematic way.

The management is efficient if it is able to accomplish the objective of the enterprise. It is effective, when it accomplishes the objectives with minimum effort and cost. In order to attain long-range efficiency and effectiveness, management must chart out its course of action in advance. A systematic approach that facilities effective management

performance is profit planning and control, or budgeting. Budgeting is therefore an integral part of management.

Profit is the ultimate goal of every business house. They involve in business for making profit. Profit cannot be achieved easily. It should be managed well with better managerial skills. So profit is the planned and controlled output of management. By element, profit is the difference of revenue (i.e. increases the revenues), and planning of cost (i.e. increase the efficiency of cost).

Comprehensive profit planning and control (profit planning and control) is a new term in the literature of business. Though it is a new- term, it is not a new concept in management. The profit planning and control can be defined as process designed to help management effectively perform significant phases of planning and control functions. The PPC involves:

- ❖ Development and application of board and long range objectives of enterprise.
- ❖ Specification of enterprise goals.
- ❖ Development of strategic long range profit plan in board terms.
- ❖ Specification of tactical short range profit plan detailed by assigned responsibilities (divisions, departments, projects).
- ❖ Establishment of a system of periodic performance reports detailed by assigned responsibilities.
- ❖ Development of follow-up procedures (Welsch, Hilton & Gordon 2000:30).
  Hence, profit planning and control represents an overall plan of operations, providing guidelines to management and acting as single light for the management. It enables the management to correct its policy. Profit planning and control covers a definite period of time and formulates the planning decision of management. It consists of three main budgets.
- ❖ Operational budget: Budget related with revenue and expenses. Such as: sales budget, production budget, purchase budget, etc.
- ❖ Financial budget: Budget related with financial statements, such as: balance sheet, income statement, etc.
- ❖ Appropriation budget: Budget related with advertising & publicity expenditure, research etc.

2.1.2 Sales Budget

The sales budget provides an estimate of goods to be sold and revenue to be delivered from sales. It is a starting point in the budgeting procedure. That is budgeting exercise usually commences with the preparation of the sales budget because the customer's demand is usually the key factor for most organization.

Sales budget is one of the functional/operating budgets and is essentially, a forecast of sales to be effected in a budget period. It defines the quantities and values of expected sales in total as well as product wise and area wise during definite period.

Sales budget forms the fundamental basis for other functional budgets and it is needed to co-ordinate the production function with expected demand for a particular product. A comprehensive sales budget includes two separate but related plans- the strategic and the tactical sales plans. A comprehensive sales budget incorporates such management decisions as objectives, goals, strategies and premises. Both Long-term /strategic and short-term/tactical plans must be developed in harmony with comprehensive profit plan.

The primary purposes of sales budget are:

- To reduce uncertainty about future revenues.
- To incorporate management judgments and decisions into the planning process.
- To provide necessary information for developing others elements of comprehensive profit plan.
- To facilitate management's control of sales activities.

The preparation of sales budget requires the forecasts of quantities to be sold and also standard prices at which these quantities may be sold. The steps of preparation of sales budget are:

Step 1 Develop management guidelines for sales planning.

Step 2 Prepare sales forecast.

Step 3 Assemble relevant data in developing a comprehensive sales plan.

Step 4 Based on steps one, two and three apply management evaluation and judgment to develop a comprehensive sales plan.

Step 5 Secure managerial commitment to attain the goals specified in the comprehensive sales plan.

2.1.3 Production Budget

Production budget is the initial step in budgeting of manufacturing operations. The production budget is an estimation of planned quantity of goods to be manufactured during budget period. To develop the production budget, the first step is to establish policies for inventories levels. Inventory budget is one of the important components of production budget. Future is uncertain so production has to be made inventory also. Inventory has direct relationship with production budget. Without making appropriate inventory policies, the organization can't prepare production budget because,

Production budget

Sales units for the period   ****

(+)Closing inventory (inventory at the end)   ****

Total requirement for the period   ****

(-)Opening inventory (beginning inventory)   ****

Production units for the period   ****

The next step is to plan the total quantity of each product that is to be manufactured during the budget period. The third step is to schedule this production by interim periods complete production plan should show budget data classified by (a) products to be manufactured, (b) interim time periods, and (c) activities of each responsibility center in the manufacturing process.

2.1.4 Purchase Budget

Manufacturing company purchases raw materials for its products to be produced. The quantity of materials to be purchased is determined by both production volume and inventory need/requirement. Purchase budget helps to determine the quantity and volume

of materials required for the budgeted period and also the inventory of materials required to be maintained. Thus inventory has also direct relationship with material purchase budget. The organization can't purchase material whenever it is needed. So organization has kept sufficient stock or inventory of material for smooth operation of the organization.

Material Usage/Consumption Budget =Production budget × Standard Usage rate.

Material Purchase budget

Material usage units for the period	****
(+)Closing inventory (inventory at the end) of material	****
Total requirement for the period	****
(-)Opening inventory (beginning inventory) of material	****
Material purchase units for the period	****

Before preparing to material purchase budget, the organization has to consider the following points

i. Units to purchase: Material usage + inventory.
ii. Reorder level (ROL): Replacement stock + Safety stock.
   Or, ROL = (Lead time × Daily Consumption) + Safety Stock.
        Where,
      Lead time = time gap between order and receive.
      Similarly for non-manufacturing organization, it has to prepare material
      purchase budget and open to buy budget.
      Where,
        Purchase budget = Sales + stock at the end + reductions – stock at the
        beginning.
        Reductions = Discount, mark up, loss on storage, damage, water, paste,
        shoplifting, etc.

        Open to buy budget = Stock needed – stock available.

Stock needed = budgeted sales for the period + budgeted reduction + stock at the end - (Actual sales to date + actual reduction to date).

Stock available = stock at the beginning + merchandise/stock received today + merchandise order for the period delivery – (actual sales to date + actual reduction to Date)

2.2 INVENTORY CONCEPT

The term inventory management is formed with two different words inventory and management. Inventory is the stock of materials held by a firm to meet its future requirement of production and sale. Management of material, part supplies, expenses tool, work-in-progress, finished products are record on the books and maintenance of store rooms, warehouses by an organization is know as inventory management. It is a system of ordering based on the maintenance of the stock in a store following a recording procedure based on the predetermined stock level. Management refers to an art, which is devoted for planning, directing, coordinating and controlling different activities to achieve the predetermined goal.

"Inventory as a current assets, differ from the other current assets because only financial manager are not involved. Rather, all the financial areas i.e. finance, marketing, production and purchasing are involved. The views concerning the appropriate level of inventory would differ among the different functional areas "(Khan & Jain, 2003:2004)".

"Inventory refers to the physical stock of goods, which though remain idle in the store but is essential for smooth selling of the company and hence has economic values "(Kothari, 1996:39).

Inventory form a link between production and sale of product. The optimum level of inventories should be judged in relation to the flexibility in inventories. The lower the level of inventories makes the less flexibility of the firm. And higher level of inventories increases of the organization.

Any things that a firm kept meeting in future requirements of production and sale is called inventory. The basic reasons for holding inventory are to keep up the production activities unhampered. It is neither physically possible nor economically suitable to wait

for the stocks to arrive at when they are actually required. Therefore keeping up inventory is a must for efficient working of a business unit (Jain & Narang, 1994:109).

2.2.1 NATURE OF INVENTORY

Every business operation however big or small has to maintain some inventory. An inventory serves as cushions to observe the stock in demand forecast and provides more efficient use of resources. Inventory for any organization is necessary thing and require careful planning and formulation of policies keeping in view the best interest of organization. Depending upon the nature of the industry and firm, inventory may be durable or non-durable, perishable or non-perishable, valuable and inexpensive.

Manufacturing firms generally hold four types of inventories:

   i.   Raw materials
  ii.   Work-in-process
 iii.   Finished goods
  iv.   Supplies and spare parts.

I.   Raw materials

Raw material represents goods kept by manufacturing firm prior to their being utilized in the production process (Jain & Narang,1984).Input in a manufacturing process, which is converted into finished products through different production stages.raw material inventories are those units, which have been purchased and stored for future production. Materials used in factory traditionally classified as direct and indirect material. Direct material generally includes all materials and parts that can be directly identified with the unit cost of the finished goods. Indirect material is generally defined as the material used in the manufacturing process, which cannot be identified. They are only the supporting materials of the products(Welsh,Hilton &Gardon,1991:241).The level of raw material inventories is influenced by anticipated production, responsibility of production, reliability of sources of supply and the efficiency of scheduling, purchasing and production operation(Western & Copeland,1982:321).Chemicals and perfumes are the main raw materials used by the company i.e. UNL.

II. Work-in-process

These categories include those materials that have been committed to the production process but have not been completed. "Goods in process include such items as components and sub assembles that are not yet to be sold."(Hampton, 1990:241).Works in process inventories are semi-manufactured products. They represent products that need more work before they become finished product for sale.

Work-in-process is neither a finished product nor raw materials. It is the product in the middle of raw materials and finished product.WIP inventories are strongly influenced by the length of production, which is the time between placing raw materials in production and completing the finished product. It is very difficult to separate which materials are WIP and which are not. Because the same materials may be a WIP as well as finished goods in other industry. It depends upon nature of production. Soap noodles are the WIP materials used by the company i.e. UNL.

III. Finished Product

Finished goods are those completely manufactured products, which are ready for sale. In a manufacturing firm, they are final output of production process. Stock of raw materials and WIP facilitate production of finished goods. "Finished goods are required for smooth marketing operation. Therefore finished goods are completely goods a waiting for sale."(Pandey, 1999:756). Mainly following types of finished products are produced by UNL.

- Detergents
- Toilet Soaps
- Personal products
- Scourers
- Laundry Soap
- Tea and Vanaspati etc.

IV. Supplies and spare parts

Firm also maintains the fourth kind of inventory of supplies. "It includes office and plant cleaning materials (soap, broom etc), oil, fuel, light, and bulb and like those materials that don't directly enter into production but the necessary for the production process. Usually

these supplies are small part of total inventory and don't involve significant investment" (Pandey, 1999:884).

2.3 MOTIVES OF HOLDING INVENTORIES

The question of managing inventories arises only when the company holds inventories. The main motives of holding inventories are to supply to required amount of inventory to different departments at needed time so that production/sales process does not hampered. "Inventories are cushions (a) to absorb planning errors and unforeseen fluctuations in supply and demand (b) to facilitate smooth production and marketing operation"(Charles T. Horngren).

Planning is related with forecasting future needs, we may not predict exactly what we need in future, and there may be some deviations/errors in forecasting so it required keeping some additional amount of stock than estimated, so that production process will not be hampered. The motives of holding inventories are:

- **Transaction motive:** It emphasizes the need to maintain inventories to facilitate smooth production and sales operation. A company should maintain adequate stock of materials for supply to the factory for continuous production. Each time all the departments need some amount of inventories to operate their activities and, it is not possible to purchase from outside every time, due to time and other constraints. So, for smooth operation of business it needs sufficient amount of inventories with it. Transaction motives means to supply the needed amount of inventory to required department at right time.

- **Precautionary motive:** It necessitates holding of inventories to guard against the risk of unpredictable change in demand and supply forces and other factors. Stock of finished goods has to be hold because production and sales are not instantaneous. A firm cannot produce immediately when goods are demanded by customers due to different reasons. The reasons may be shutdown, chakkajam, lockouts, shortage of inventories, price increase etc. Therefore, if this happened production/sales process will be disturb/hampered. So, to avoid these risks companies generally maintains some optimum level of inventories. "The level of finished goods, inventories would depend upon the coordination between sales and production as well as on production time" (Pandey, 1999:984).

- **Speculative motive:** It influences the decision to increase or reduce inventory levels to take advantage of price fluctuations. Generally the prices of inventories are rising, so the companies may keep additional amount of inventory to get benefit by selling the surplus inventory at higher price than purchase price. It is too risky due not certainty that when price will rise and it will cost lot of holding such inventories.

2.4   NEED/BENEFITS OF HOLDING INVENTORIES

There are many benefits of holding inventories. Inventories are used to provide cushions so that the purchasing, production and sales function can proceed at their own optimum paces. "In achieving the separation of these functions, the firm realizes a number of specific benefits"(Hampton,1990:228).

i.   Avoiding Losses of sales

If the firm doesn't have goods available for sale, it will lose sales. Customers requiring immediate delivery will purchase their goods from the firm's competitors and other will decide that they do not need the goods after all, if they must wait for delivery. The ability of the firm to give quick service and to provide prompt delivery is closely tied to the proper management of inventory.

ii.   Gaining Quantity Discounts

If the firm is willing to maintain large inventories in selected products lines, it may be able to make bulk purchase of goods at large discounts. Supplies, frequently offer a greatly reduce price if the firm orders double or triple its normal requirement. By paying less for its goods, the firm can increase profits as long as the cost of maintaining the inventories are less then the amount of discount.

iii.   Reducing Order Costs

Every time a firm places an order, it incurs certain costs. Forms must be typed, checked, approved and mailed. When goods arrive, they must be accepted, inspected and counted. The invoice must be checked with the goods and then sent to the accounting department so that supplier can be paid. The variable costs associated with individual orders can be reduced if the firm places a few large then numerous small orders.

iv. **Achieving Efficient Production Runs**

Once a assemble line or piece of machinery is prepared to receive certain raw materials and perform selected production operation set up cost has been incurred. This cost must be absorbed in the subsequent production run. Inventories assist the firm in making sufficiently long runs to achieve efficient production.

2.5 OBJECTIVE OF INVENTORY MANAGEMENT

Inventory is the most important to all manufacturing and non-manufacturing organizations as well in today's industrial and commercial world. So, it is necessary to manage it properly because both situations of inventories i.e. either excessive or inadequate are not desirable to the industry.

However, the main objective of inventory management is to minimize the total cost and maximize profit of the companies. It can be explained as follows:

1. **To supply required amount of raw material smoothly**

There should be a continuous availability of materials in the factory or finished goods for trade. The main objective of inventory is to maintain required inventory in needed time. So that production process will take place smoothly.

2. **To minimize the risk of under and over stocking of material**

If any company keeps inventory without proper analysis, than there will be chances of overstocking, which will increase the cost of carrying inventories or under stocking of inventories that create problem in smooth operation of business. So one of the main objectives of the inventory management is to minimize the risk of under and over stocking of inventory.

3. **To reducing the material losses and damaged**

Inventory management will help to keep optimal level of inventory; it helps to avoids neither keeping overstocking nor keeping under stocking. By keeping overstocking there will chances of damage of inventories due to storing problems or other where as if there is under stocking there will be problem in handling due to purchase order may place when there will be urgency of material, hence there

will be chances of breakage or theft. In this way, one of the main objectives of inventory management is to reduce the material losses and damage.

4. **To maintaining systematic record of inventory**

Management may needs different information of inventories for planning and decision- making. Inventory management provides such information, which is very useful for management to make decisions. By maintaining systematic record of inventory it also evaluates the current inventory management policy is optimal or not?

5. **To minimizing, the costs associated with inventory**

By proper maintaining the information regarding inventories, it helps to make decisions like whether to take discounts or not, in which lot size order should be placed, when to order etc. Analysis of all these will helps to minimize the total cost associated with inventory. There should not be unnecessary investment in stock if the organization maintain adequate quantity, the capital can be saved and used it in productivity field to maximize the profit.

6. **To make stability in price**

Keeping optimal level of inventory, it safeguards the company from regular price fluctuations, so it helps to fixing price of goods and service stable.

7. **To maximize profit**

By reducing cost associated with inventory, by reducing wastage and damages company will be able to produce goods and services at minimum price, so, the company can maximizes its profits.

8. **To minimize the storage cost**

It is a scientific way to maintain the required stocks which minimize the storage cost.

2.6 TECHIQUES OF INVENTORY MANAGEMENT

To manage inventories effectively, a firm should use a system approach to inventory management. A system approach considers in a single model all the factors that affect the

inventory. The model called a system may have any number of sub systems tied together to achieve a single goal. "In the case of inventory systems, the goal is to minimize the costs" (Hampton, 1990:235).

"The financial manager should aim at an optimal level of inventory on the basis of the trade off between cost and benefit, to maximize the owner's wealth. Many sophisticated mathematical techniques are available to handle inventory problems. But, they are more approximately a part of production management" (Khan & Jain, 2003:20.11).

To manage inventories, the firm's objective should be in consonance with the shareholders wealth maximization principle. To achieve this, the firm should determine the optimal level of inventory. Efficiently controlled inventories make the firm flexible. Inefficient, control result in unbalanced inventory and flexibility the firm may sometimes run out of stock and sometimes may pile up unnecessary stocks. This increase the level of investment and the makes the firm unprofitable.

To manage inventories efficiently, answers to be sought to the following two questions:

- How much should be ordered?
- When should be ordered?

"The question, how much to order, relates to the problem of determining economic order quantity, and is answered with an analysis of costs of maintaining certain level of inventories. The second question, when to order, arises because of uncertainty and is a problem of determining the re-order point" (Pandey, 1999:902).

In every aspect of inventory management, there is necessary control of inventory. There are various techniques of inventory control to avoid excess cost, physical loss, damage, theft, over inventory and lower inventory; some of these techniques are discussed below.

2.6.1 Economic Order Quantity (EOQ)

"EOQ is important concept in the purchase of raw material and the storage of finished goods and transit inventories. To determine the optimal order quantity for a particular item of inventory, given its forecasted usage ordering cost and carrying cost. Ordering can mean either the purchase of the item of its production" (Van Horne, 2003:377).

EOQ is defined as the ordering level of inventory or quantities that minimizes the total inventory cost. Inventory cost means ordering/set-up cost plus carrying cost/holding cost plus cost of inventory less discounts if any.EOQ is an inventory management tool, which shows quantity to be order, which minimizes total inventory cost with comparing to other order size. If there is no safety stock and no discount, at this point (at EOQ) total ordering cost and carrying cost be equal. Thus, EOQ is the quantity that will minimize the total inventory cost. It is also known as "Standard Order Quantity," or "economic Ordering Quantity "or "Optimum Ordering Quantity".

EOQ refers to the order size that will result in the lowest total of order and carrying costs for an item of inventory. If a firm places unnecessary orders. It will incur unneeded order costs. If it places too few orders it must maintain large stocks of goods and will have excessive carrying costs. By calculating a EOQ, the firm identifies carrying costs. "By calculating a EOQ, the firm identifies the number of units to order that results in the lowest total of these two costs"

How much to order, or produce is one of the main problems of inventory management. That is, the determination of a quantity for which the orders should be placed is one of the important problems concerned with inventory management.

Therefore, it is necessary to calculate order quantity which minimizes carrying cost and ordering cost. Reorder quantity is such that when it is added to the minimum stock, it should not exceed the maximum stock.

2.6.2 Economic Order Quantity Assumptions

The EOQ model relies on several assumptions:
➢ There is a continuous, constant and known demand rate.
➢ The lead time/replacement cycle is known and constant.
➢ The constant purchase price is independent of the amount ordered.
➢ Transportation costs are constant no matter the amount moved or the distance traveled.
➢ No stock outs are permitted.
➢ There is no inventory in transit.
➢ All inventory parts are independent of each other.
➢ The planning horizon is infinite.
➢ There is no limit on the amount of capital available.

These assumptions often stay far from real life. Demand is rarely continuous, constant and known, lead times, transportation costs and prices vary. No inventory in transit means that the firm buys on a delivered price basis and sells. Planning horizon is limited, as is capital available. Nonetheless, EOQ is most widely used single inventory model. It is simple to use and it produces exact answers.

There are variations to basic EOQ. One variant keeps the order quantity constant, but flows the timing to vary. This is known as the fixed quantity, variable time model. Another EOQ variation is the orders time (re-order point) but vary the order quantity (variable quantity, fixed time).

2.6.3 Prerequisite for EOQ

Following facts are to be considered as prerequisites for determination of EOQ.

- ➢ Holding cost per unit per (period) year.
- ➢ Ordering cost per order.
- ➢ Annual requirement or quantity required per period.
- ➢ Cost per unit.

2.6.4 Approaches to set EOQ

EOQ can be computed by using different methods. Among them some major methods are as follows:

1) Mathematical or formula method.
2) Trial and error or Tabular method
3) Graphic method

1) Mathematical or formula method

Mathematical methods are also available to calculate economic order quantity. There are numerous method exist, as the field of inventory management and can be studied in college programs such operation research and production management. Even many mathematical method exists, the main objective of this method is to reduce, minimizes the inventory cost/total costs.

Without getting into highly refined decision methods we can illustrate the concept of EOQ with a basis mathematical method. We calculate EOQ by using the following formula:

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

Where,

A = Annual demand/ Requirement /Sales

O = Ordering cost per order

C = Carrying or holding cost per unit per year

EOQ = Economic Order Quantity.

If the company orders EOQ units each time, it will minimize total inventory costs. The following example proves this;

The UNL Ltd purchase 100,000 kg (A) raw materials annually. The ordering cost (O) is Rs 500 and the carrying cost (C) is Rs 4. The economic order quantity will be,

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

Because UNL Ltd requires 100,000 kg, it is necessary to place 20 orders per year to satisfy the demand (100,000/500=20).

2) Trial and error approach

This is another approach to calculate economic order quantity. A firm has different alternative purchase policy of its inventory. It can purchase its entire requirement own one single lot. Alternatively, the firm can purchase its inventory is small lots periodically say weekly, monthly, bimonthly, half yearly and so on. It means more than one time the firm can place on order to purchase inventory. The smaller lot sizes the lower average inventory and vice-versa. How inventory holding are associated with high ordering cost and low carrying cost.

This approach to the determination of EOQ uses different permutations and combination of total cost inventory purchase so as to find out the total cost.

According to this approach the carrying and ordering cost for a different sizes of order to purchase inventories computed and the order size with the lowest total cost(ordering + carrying) of inventory is the economic order quantity(Khain &Jain,2003:20.7).

Under this approach, we prepare table and try at different order size for this the following consideration to be taken into mind according to this:

Calculation of EOQ by using Tabular Method

(1)Ordering size (Q)	***	***	***
(2)No. of order = N or(A/Q)	***	***	***
(3)Average inventory =(Q/2)	***	***	***
(4)Total carrying cost = (Q/2 × C)	***	***	***
(5)Total ordering cost =(A/Q × O)	***	***	***
(6)Total cost (4 +5)	+++	+++	+++

Note: Total cost does not include the cost of inventory for purchase, so total cost of inventory will be total carrying costs plus total ordering costs plus cost of inventory less discount if any.

3) The Graphic Approach

The economic ordering quantity can also found out graphically. Figure 2.1 given below illustrates the EOQ function. In the figure, carrying, ordering and total costs are plotted on vertical and horizontal axis is used to represent the order size. Total carrying increases as the order size increases, because, on an average larger inventory will be maintained, and ordering costs decline with increase in order size because large order size means less number of orders. The behavior if total cash line is noticeable since it is a sum of two types of costs, which behave differently with order size. The total costs decline in the first instance, but they start rising when the decrease in average ordering cost is more than offset by the increase in carrying costs. The EOQ occurs at the point Q where the total cost is minimum. Thus, the firms operating profit is maximized at point Q.
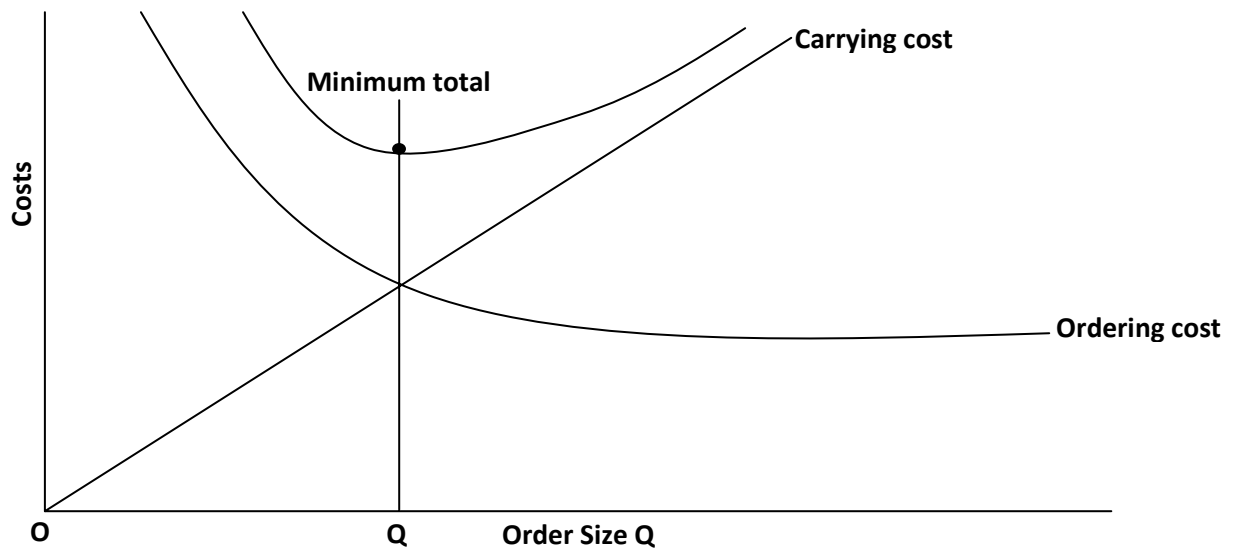
Figure No. 2.1: Graphic Approach of EOQ

It should be noticed that the total cost of inventory are fairly insensitive to moderate changes in order size. It may, therefore, be appropriate to say that there is an economic order range, not a point. To determine this range, the order size may be change by some percentage and impact on total cost may be studied. If the total costs do not change very significantly, the firm can change EOQ within the range without any loss (Pandey, 1999:888).

2.7 ROLE OF INVENTORY IN OVERALL PROFIT PLANNING OF THE ORGANIZATION

Profit Planning and Control (PPC)is important approach developed for effective management system mainly in profit-oriented organization. Simply planning is the process of forecasting for future time period. It shows the direction for the organization where to go and how to go to accomplish the certain objective made by the organization. Without making appropriate plan, the organization can't reach its destination. A profit plan or budget is comprehensive and coordinated plan, express in financial terms for the operation and resources of an enterprise for some specific period in future. Profit planning is the part of overall planning. PPC includes comprehensive, coordinated, financial terms, resources plan, time etc.

For appropriate profit planning of the organization it has to prepare different budgets like sales budget, production budget, material purchase budget, material usage/consumption

budget, open to buy budget, labour hour budget, labour cost budget, overhead budget(manufacturing as well as non manufacturing overhead),flexible expenses budget, capital expenditure budget, cash budget(cash receipt and cash disbursement budget),budgeted income statement, budgeted balance sheet, activity based budget, cost volume profit analysis (CVPA),etc.

2.7.1 COORDINATION BETWEEN SALES, PRODUCTION AND INVENTORY

The manager must plan an optimum co-ordination between production, inventory and sales. An efficient coordination production plan is necessary for optimum production and sales. There may be high pressure from both sales and manufacturing for high inventory level. The production budget and inventory policies provide the basis for obtaining this co-ordination.

Production manager must translate the quantity in the sales budget into production requirement for the budget period for each product while considering the management of inventory policies. An efficient plan should represent the optimum co-ordination between sales budget, essential inventory levels and production levels.

2.8 RESPONSIBILITY OF PRODUCTION MANAGER

In the present day of cut throat competition at various stage of production an enterprise should produce goods and services keeping into consideration for the requirement & satisfaction of potential customer. The objective should be to produce goods at least cost and to maximize satisfaction of the buyer. The production manager assembles appropriate resources and direct use of those resources, which may be man, machine, material, capital, processes, etc. Thus "manager has to pay more attention not only to what their customers might buy also to increasing government regulation and behavior of customer and environment protections group"(Goel,1992:61).

The main responsibility of the production manager can be presented as:

- ❖ Producing right quantity of material right time.
- ❖ Should concern with production planning.
- ❖ Fully responsible product and quality control.
- ❖ Capable to select the most efficient and economical method to perform the operations.

❖ Plant layout and material handling.

❖ Use of proper inventory model.

❖ To find the relationship between output and input etc.

2.9 METHOD OF INVENTORY COMPUTATION

We can calculate inventory by different methods. Mainly the organization can compute inventory by following methods.

1. **Average sales method:**

This method can be divided into 2 categories.

- **Average sales method:**

Under this method inventory is calculated with average sales of certain time period.

$$\text{Inventory} = \frac{Yearly\ sales/total\ sales\ during\ the\ time\ period}{No.\ of\ time\ period\ or\ 12} \times Require\ stock\ of\ period$$

It is stable and suitable to basic product but it can't be used in big organization.

- **Moving Average method:**

It is based on uneven no of period mostly 3, 5 or 7.Under this method inventory can be calculated as:

$$\text{Inventory} = \frac{Sales\ (Previous\ months/s+\ current\ month\ +\ next}{Total\ no.\ of\ time\ period} \times Require\ no.\ of\ month$$

Under this method, both inventory and production are fluctuating. It is appropriate in those organizations, whose are highly seasonal.

2. **Sales to turn over ratio:**

This method is also two types.

- **Historical sales turnover ratio method:**

This method is also called HSTR, turnover method or withdrawn method. Under this method inventory is calculated on the basis of historical ratio of sales to inventory.

Inventory = Sales for the period $\times$ HSTR or Multiplier

Where,

HSTR = Historical sales Turnover ratio

$$= \frac{\text{No. of month in a year or 12 (N)}}{\text{Turnover Time (TT)}}$$

And $TT = \frac{\text{Sales (historical) for the year}}{\text{Average inventory}}$

Average Inventory $= \frac{\text{Opening inventory + closing inventory}}{2}$

It is stable and shows the relationship between sales and inventory.

- **Turnover Time Method:**

Under this method, inventory can be calculated as;

Inventory $= \frac{\text{Total Sales / Budgeted sales for the year}}{\text{Turnover Time}}$

Mostly it is used for stable inventory policies.

3. **Proportional sales method:**

It is not widely used. Mostly it is used in small industry or basic product/commodity or monopoly market, which has certain sales. Under this method inventory can be calculated as;

Inventory = Sales for the month $\times$ given ratio.

2.10 DETERMINANTS OF INVENTORY POLICIES

Inventory policies or levels are affected by different factors. Sometimes the organization has kept more inventories whereas in some times it has to kept low inventory levels. Some major determinants of inventory are as follows:

a) **Types of market:**

Sales season affect inventory policies. In peak season the organization has to kept high inventory whereas in slack season it has to kept low inventory. So organization has to keep inventory according to types of market or sales season.

b) **Types of products:**

For necessary product, inventory is stable or it has to kept low inventory whereas for luxuries goods high inventory is required. So while determining inventory level, organization has to consider regarding the types of products.

c) **Life of products:**

If goods are perishable, low inventory is required but for durable goods the organization can kept high inventory. So the life of the product affect in determining inventories.

d) **Processing time:**

If production/process time is long, high inventory should be kept otherwise organization has to keep low inventory.

e) **Establishment cost:**

If pre-production or establishment cost is high stable inventory is better otherwise organization has to keep inventory in fluctuating level.

f) **Availability of capital:**

If sources of capital are cheap and sufficient, it can be kept high inventory. And if sources of capital are more expensive or scare, organization has to keep low inventory level.

g) Storage facility:

If the organization has its own and ideal store, it can be kept high inventory otherwise it has to keep low inventory level.

h) Storage risk:

If loss on storage like obsolesces, season off, out of fashion, loss due to fire, theft mice paste, decrease in price, lifting by employee, it has to kept low inventory otherwise it can be kept high inventory.

i) Availability of raw material:

If material are easily available in the market, it can be kept low inventory otherwise it should be kept high inventory.

j) Re-order point:

If re order point is long, the organization has to kept high inventory but if re order point is short, the organization has to keep high inventory level.

2.11 PROCEDURES OF INVENTORY MANAGEMENT

The procedures of inventory management cover the activities such as purchasing, receiving and store keeping, issuing and pricing the inventory items.

2.11.1 Purchasing

Purchasing to a manufacturing concern is of extreme importance because it has it's bearing on every vital factor concerning the manufacture i.e. quantity, quality, efficiency, economy, prompt delivery, volume of production etc. It is the scientific purchasing that can save much money, time and efforts of the management.

In manufacturing organization, purchasing is the procuring of materials, supplies, machines, tools and services required for the equipment maintenance and operation of the business. Purchasing must be of right quantity with proper quality for delivery at the correct tie at the most favorable price from outside the organization.

Purchasing is the task related to going the open market finding the desired materials at the lowest possible price and selecting the supplier who offers it at that price having the quality of the quality of the material in mind.

Objectives of Purchasing

The objectives of purchasing should conform the overall objectives of an organization. The objectives of purchasing are the objectives of integrated logistics. The efficient acquisition of products and services the right material, in right quantity, in right condition, at the right time, from the right source, with the right service and the right price.

More explicitly is expected to accomplish nine items (Bloomberg & Hanna, 2002:481).

(a) Provide an uninterrupted flow of materials, supplies and services required to operate the firm.
(b) Minimize inventory investment and loss.
(c) Maintain adequate quality standards.
(d) Find or developed competent suppliers.
(e) Standardize, where ever and whenever possible, the items bought when ever possible.
(f) Purchased required item and services at the lowest ultimate price.
(g) Improve the organizations competitive position.
(h) Work harmoniously with other department in the organization.
(i) Accomplishing the purchasing objectives at the lowest possible level of administrative costs.

Procedure of Purchasing

"Effective purchasing means learning the purchase requirements, identified qualified sources of supplies, minimizing the total cost of supplies and administrating the purchase"(Adam & Ronald,2003:221).While individual purchase may appear quite different, this is general underlying purchasing process. The process is described below.

I. **Purchase Requisition**

The initiation of purchase begins with the formal request from the carious sections or departments to the purchase department to order goods. The request is made in purchase requisition slips to the purchase department by the departments needing the goods

authorizing the purchase department for procuring the goods as per the specification given the slip by the date mentioned on it.

II. Decision for Purchase

On receipt of the purchase requisition, the purchase department then decides what and how much to buy taking into consideration various limitations and constraints in purchasing the goods. As far as possible the raw material should be purchased in sufficient quantity neither less nor more, to continue the flow of production, for purchasing other materials or plant and equipments, the necessary permission should be obtained from the authority concerned and the finance department to release the finance.

III. Study of market condition and sources of supply

Having the decision for the purchase of materials, the purchasing agent should study the market condition on the basis of market reports as to when and what goods should be purchased. An intensive study should also be made in regard to the source of supply from where the goods can be procured with the help of catalogues, directories, old records, price lists of vendor and purchase order etc.

IV. Selection of vendor

On the basis of studies of market conditions and source of supplier, the purchasing agent selects the vendor keeping in mind the reliability of his price movement history, his delivery record and other service required and his past co-operation. Sometimes supplier is selected out of the listed of the suppliers registered with the company for the supply of goods or sometimes quotations or price bids or tenders are invited from the prospective suppliers on the studying of supply and the quality and quantity of goods, vendor is selected out of the bidders or tenderizer.

V. Purchase Order

Having selected the vendor supplier a purchase order is prepared in the prescribed form by the purchase department and sent to the vendor authorizing him to supply specified quality of materials at the stipulated terms, at the time and place mentioned therein. It forms a formal contact between the purchaser and the vendor.

VI. Receiving of materials

When goods arrive they are taken to delivery and the receiving clerk checks materials with the order placed by the purchasing department to the vendor. After proper checking, goods should be delivered to the store department or to other department that requisitioned them. On checking if any discrepancy is found as regards to quality or quantity, it should immediately be referred to the purchasing department so that discrepancy may be adjusted.

2.11.2 Receiving and Store keeping

Store keeping is a specialized and important function of material control that is especially concerned with the physical storage of goods. The storekeeper is responsible for safe guarding and keeping the materials and supplies in proper places until required in production. It is service function and the storekeeper is the in-charge of storekeeping. He is the warden of the goods stored in the store and maintains a record of all movements of materials. Storekeeper is in fact a connecting link between planning and the production department. Purchase control must be matched by effective stores control to avoid losses from damage, deterioration and carelessness.

Objectives of store keeping

The major objectives of storekeeping may be stated as follows:

- ➢ Receiving, handling and issuing goods economically and efficiently.
- ➢ Using the storage available space and labor effectively.
- ➢ Protection of all goods in stores against all losses from fire, theft and obsolesce.
- ➢ Minimizing regular supply of raw materials of all times when properly authorized.
- ➢ Facilitating ordering of required materials.
- ➢ Minimizing the inventory handling cost.

To achieve the above said objectives a firm generally uses different types of controlling devices like:

(a) Bin cards

Bin is the term used to symbolize the place or shelf or rack or pigeon-hole or even a big room where materials are stored and the card attached to the bin or tag hung there is known as Bin card. Bin card shows quantitative details of receipt, issue and balance of materials in the bin. These cards also show the maximum level, minimum level and re-order level of the materials. It helps the storekeeper to control material. Bin card is used by the storekeeper to keep only quantitative record for all items of materials in store. Remember that, it does not record the value of materials. By seeing the Bin card the storekeeper can send the materials requisition for the purchase of materials in time.

Sample of Bin card

Bin card no.   Bin No.

Name of the articles: Maximum quantity:

Code No: Minimum quantity:

Store ledger folio: Ordering quantity:

Date	Receipts		Issues		Balance	Stock verification	
	Ref. No	Qty	Ref. No.	Qty	Qty	Date	Initial

(b) Store Ledger

This ledger is kept in the costing department and is identical with the bin card except that receipts issues and balanced are shown with their money values. This contains an account for every time of stores and makes a record of the receipts, issues and the balances, both on quantity and value. Thus, this ledger provides the information for the pricing of materials issues and the many value at any time of each items of stores (Jain & Narang,1991).

Sample of Store ledger

Name of article: Maximum quantity:

Code no.   Minimum quantity:

Bin No.   Ordered quantity:

Date	Receipt				Issues				Balance			Remarks
	S.No.	Qty	Rate	Amt	S.No	Qty	Rate	Amt	Qty	Rate	Amt	

2.11.3 Issuing and pricing

Each item the inventory has some value associated with it. This value depends on the price duration of the item inside the inventory, procurement cost, storage cost etc. Pricing the inventory is one of the most interesting and widely matters in accounting process. Many organizations are interested in various method of pricing inventory because it has a direct affect on the income. Inventory valuation approach is important in the aspect of income tax problem.

A basic function of the store keeper is to issue materials as required. The function should embrace prompt efficient service and the accurate recording of each transaction. The vouchers that support each materials issue may include some of requisition that specify quantity, time and place of the delivery. The requisition should indicate proper authorization and the account or order to which material cost is to be changed.

When materials are issued from the storeroom on requisition, there cost is deducted from the inventory balance. Their cost is also entered in the cost accounting records of material cost of goods in process of manufacture suppliers issued for use in a line or staff department are also deducted at cost from the inventory balance and are recorded as an expense of the department.

There are many methods of inventory valuation but most significance method is cost and other method is lower of cost of market. Both methods give different results.

Cost basis for inventory valuation

The primary basis of accounting for inventory is cost which has been defined generally as the price paid to considerate given to acquire an asset. As applied to inventories, cost means in principle the sum of the applicable expenditure and changes directly or indirectly incurred in bringing an article to its existing condition and location.

Conceptually, the process of valuation the inventory is simple. We can calculate inventory value that multiplying physical quantity of goods by cost per unit. But in practice, many organization's purchase different types of raw materials at different price and different time.

It is not always possible to identify the individual particular purchase group. At that solution firms have faced difficulties in valuation the inventories. In this situation there are many methods which are based on historical cost used in determining the value of inventory are:

(a) Specific identification method

The specific identification method requires that each unit in inventory be identified with the particular time, it was purchased. In this method, the item have serial numbers or are distinguishable by model, color or size to identify the particular items but specific items separate at first and record in stock book. This method is more suitable to low volume high cost item such as automobiles. It is not very practical when the firm purchases large quantity of identical units of various time and prices.

(b) Weighted average cost

It assumes that goods are removed from the beginning inventory and purchases group in proportion to the number of units, in these groups consequently; cost of the ending inventory also represents a proportional distribution from the beginning inventory and various purchase groups. The weighted average cost computed by dividing the total cost goods available for during the period.

Weighted average cost $= \dfrac{\textit{Total cost of goods available for sale}}{\textit{Total units available for sale}}$

The method is widely used by organization that hold item of inventory long period of time because it average out of the effects of price increases and decreases. In addition, weighted average process is satisfactory when there are both increases and decreases in cost within the accounting period. Some organization uses this method which purchases the inventory items frequently interval because it does not require that the ending inventory cost be associated with any particular purchases group. A common criticism of the methods is that in attaches no more significance to current price then to price that prevailed several months earlier.

(c) First in first out (FIFO) method

FIFO method is based on the assumption that the materials first received are the first to be issued. The materials received and changed on each invoice are changed out from the inventory are the price stated on that invoice until the lot has been exhausted. Materials issues are then assumed to be issued from the next lot received at the invoice price of the second lot until that lot is exhausted. The units on hand at any time are assumed to be the units last purchased because all issues of materials have been made from the earlier issues. The FIFO method is used in the balance of stores record.

(d) Last in first out (LIFO) method

The LIFO method of pricing is based on the assumption that the last units received are the first to be issued. Materials issued from stock are charged out at the cost of the latest shipment received until that lot is exhausted. The next issues are then made from the next order preceding, provided the materials in that order were not previously issued. This method is designed to charge goods manufactured with the prevailing costs materials instead of with cost which may have been paid for materials at a much earlier date.

(e) Standard cost method

LIFO, FIFO and weighted average cost methods are often awkward to work within the subsidiary records for materials under perpetual inventory system. For this standard cost method may be used in accounting for individual items in materials inventory (Man Mohan & Goyal, 1997:294).

This method charges material unit into the factory at a predetermined a budget or estimated price reflecting a normal or an expected future price. Receipts and issues of

materials are recorded in quantities only on materials cared there by greatly simplifying the record keeping. Then, there is a basis for comparing existing cost from day to day, which should exist under normal condition.

(f) Based stock method

Accounting to this method, a certain quantity or base stock of material is assumed to be necessary to keep the going to be concern. The base stock is valued at the cost prevailing at the time firm began or when the method was adopted. Any additional layers of materials in the inventory of close beyond the unit. The base may be on the basis of FIFO, weighted average etc method.

All method has their advantage and disadvantage. However, the method chosen is significant for efficient inventory management especially in its financial dimensions.

2.12 INVENTORY MANAGEMENT MODELS

Inventory management models can be classified either push or pull models:

2.12.1 Push inventory model

Push models schedule orders for production or order goods in advance of customer demand. Manufactures push the finished products through the distribution channel to intermediaries and the final consumer. Economic order quantity (EOQ), Material requirement planning (MRPI), Manufacturing resource planning (MRPII) and distribution requirement planning (DRP) are all push models.

Types of push inventory model

Mainly there are following 4 types of push inventory models:

a) Economic order quantity (EOQ)

In an ideal environment, forecasting demand would be easy and straight forward. Simply look at past demand patterns to predict future consumption. Under these conditions, EOQ model can be used to calculate when to order the item and how much to order.

b) Material requirement planning (MRPI)

MRPI is a manufacturing-planning tool. It is a computer based production and inventory control system that minimizes inventory while ensuring that adequate materials are available for production. MRPI performs three functions.

➢ Ordering planning and control: When to release orders and what quantity.
➢ Priority planning and control: How the expected date of availability compares to the need date for each item.
➢ Planning capacity requirements and development of broad business plan.

Although the principles of MRPI can be applied to distributing job shops and process industries, it fit best in continuously assembly of standard products like automobiles and electrical equipment.

MRPI pushes products through manufacturing and distribution process on a schedule to meet forecasted demand. As processes improve, the integrated logistics pipelines become shorter, so order replaces forecasts earlier and earlier. When the time between the start of production and customer delivery is acceptably short, then each job is an order.

c) Manufacturing resource planning (MRPII)

While MRPII addresses the inbound flow of inventory, MRPII add finance, marketing and integrated logistics like MRPI and MRPII is a push inventory model. However, it adds to the basic model.

MRPII considers not only inbound flow materials but also plant capacity. Additionally, it handles production scheduling, labor needs and inventory budgets. MRPII benefits could include fewer shortages and stock outs, which should increase customer service, improve delivery, allow better response to demand changes, reduce inventory levels and costs, and allow more planning flexibility.

d) Distribution requirement planning (DRP)

DRP applies MRPII principles to the flow of finished goods to field warehouses and customers. Although MRPII improved MRPI by taking into account both material management and production scheduling, it failed to account for this out bound movement.

DRP adjusts ordering patterns of inventory needs vary, responds more readily to system wide inventory needs, and better deals with product availability and receipt timing.

2.12.2 Pull inventory model

Pull inventory models are based on making goods once customer demand is known. The product is pulled through the channel of distribution by the order. Recent trends suggest a movement to use pull inventory models to reduce inventory through out the channel. JIT and KanBan are the must widely used pull inventory models.

Types of pull inventory model

a) Just-in-Time inventory model:

JIT is disciplined approach to improve manufacturing quality, flexibility and productivity through the elimination of waste and the total improvement of people.JIT is not simply reducing inventory, rather its overall objective is increased quality.

There are three components to JIT. First is JIT purchasing which ensures that the materials arrive so that production can immediately use them. Next is JIT manufacturing, which production finished goods for immediate shipment, sub-assemblies for immediate assembly, and fabricate parts for immediate use in sub-assemblies. Last is JIT delivery, which transports goods to meet the tighter transit times and reliability standards of JIT operations. All three JIT components must work together for a company to benefit from them.

JIT reduces costs primarily through the application of experience curve and economies of scale. Economies of scale mean making more of the same product with same sources. This reduces the permit cost by spreading fixed cost over more units.

According to Shigeo Shingo, a JIT authority and engineer at Toyota Motor Company identifies seven wastes, as target of continuous improvement in product process. The seven wastes are:

- Waste of over production.
- Waste of waiting.
- Waste of transportation.
- Waste of processing itself.

- Waste of stocks.
- Waste of motions.
- Waste of making defective products.

b) KanBan pull model

The KanBan means, "Visual record" and is the production control system the uses JIT production system, allowing production with smaller inventories. KanBan is also referred to as card system, a single card and two-card KanBan system.

i) Two card KanBan

Inventory is usually controlled at low levels by using a manual two card KanBan system. One card is conveyance KanBan, the requisition and authorization of transference of materials from supply center to work center. A second card the production KanBan authorizes the production of materials.

The inventions of raw materials, component parts or final product do not exist.

ii) Single card KanBan

The single card KanBan system uses only a conveyance KanBan and no production KanBan. The single card KanBan is must common used in Japan (Shrestha & Silwal, 2002:157).

2.13 COST ASSOCIATED WITH INVENTORY

Two types of costs are associated with inventory: Carrying cost and ordering cost. Carrying costs are associated with physically storing a product, while ordering costs are the costs of placing an order. These two inventory costs are having an increase relationship. Firm can carry more inventory and order less often, or order more often and carrying fewer inventories. While carrying cost increase, ordering fall and vice versa. The problem is to find the lowest total cost (Bloomberg & Hanna, 2002:159).Mainly there are two types of cost.

2.13.1 CARRYING COST

Carrying cost are associated with physically storing goods, once the goods have been accepted they become part of firms inventories prior to the recent period of high interest rates, a number of studies determined that the annual cost of carrying a production inventory ranged between 10 and 34 percent of the value of the inventory, with the model figure running at approximately 25 percent. The escalating cost of money since 1979 however has increased the typical firm's annual inventory carrying cost to appropriate 30 to 35 percent of the value of the inventory. Five major elements make up these casts in the following manner.

1. Opportunity cost of investment funds   12-20%
2. Insurance costs   2-4%
3. Property taxes   1-3%
4. Storage costs   1-3%
5. Obsolescence and deterioration   <u>4-10%</u>

      Total carrying cost   20-40%(Dobler 1992)

Total carrying cost vary in proportion to the value of inventory usually they are computed from the following formula.

Total carrying cost = Average inventory × Carrying cost per unit.

Symbolically $TCC = \frac{Q}{2} \times C$

Where,

      Q = Quantity order size.

2.13.2 ORDERING COST

Ordering cost consist of order costs, set up costs, or both ordering cost could include preparing and processing the order request, selecting a supplier, checking the stock, preparing the payment and receiving inventory levels. Set up costs refers to modifying the manufacturing process to make different goods. They include personnel costs, as well as

capital equipment costs. Many firms use blanket orders to reduce order costs (Bloomberg & Hanna, 2002:161).

The term ordering cost is used in case of raw materials (or supplies) and includes the entire cost of raw materials. They include cost incurred in the following activities.

➢ Requisition
➢ Order placing
➢ Transportation
➢ Receiving, inspecting and storing
➢ Clerical and staff

Ordering cost increase in proportion to the number of orders placed. The clerical and staff costs, however do not have to vary in proportion to the numbers of ordered placed and one view is that so long as they are committed costs, they need not be reckoned in computing ordering cost. Alternatively, it may be argued that, as the number of orders is increase. The clerical and staff costs tend to increase. If the number of orders are drastically reduced, the clerical and staff force released now can be used in other departments. Thus, these costs may be included in the ordering costs. It is more appropriate to include clerical and staff costs on a pro-rata basis. Ordering cost increase with the number of orders; thus the more frequently inventory is acquired, the higher the firm's ordering costs. On the other hand, "if the firm maintains large inventory levels, there will be few orders placed and ordering cost will be relatively small. Thus, ordering cost decrease with increasing size of inventory"(Pandey,1999:894).

Firm's usually after discount for purchase materials in large quantity, such discounts help reduction in the unit price of the items purchase, such facilities encourages buyers to place a fewer orders rather than placing one.

Ordering cost is calculated by using by following formula.

Total ordering cost $= \dfrac{Annual\ requirement}{Quantity\ order\ size} \times Ordering\ cost\ per\ unit$

Symbolically,

$$TOC = \frac{A}{Q} \times O$$

Cost Trade Off

Our objective in inventory management is to find out the minimum cost operating doctrine over some planning horizon. We need not to consider all relevant costs. Using a one-year planning horizon, the cost can be expressed in a general cost equation.

Total annual-relevant costs = Cost of item + Procurement cost + Carrying cost + Stock out costs.

Each cost in equation can be expressed, in terms of order quantity and reorder point for a given inventory situation. The solution method is then to minimize the total cost. This can be accomplished graphically, be tabular analysis using trial and error, or by using calculus, the most accurate method. Using calculus, operation researchers have developed a wide range of optimal formulas, which vary with change in the actual inventory situation. Graphically, minimizing total cost means cost trade offs.
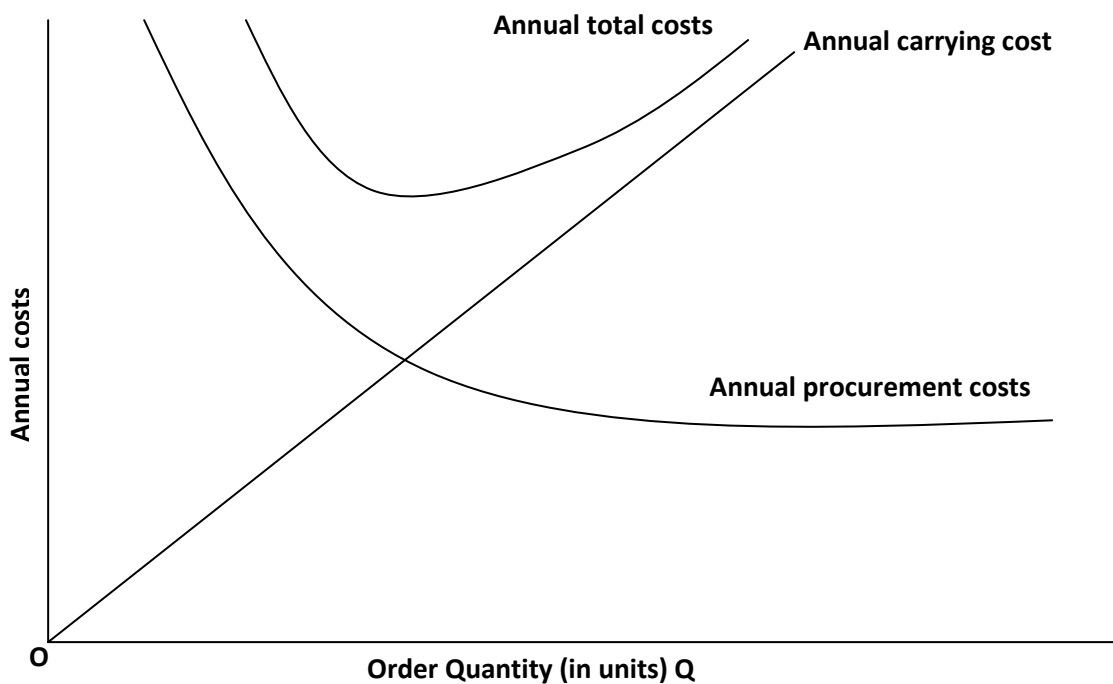
Figure No. 2.2:Cost Trade Off in Inventory Control (Q is the optimal ordering quantity)

There, as shown in figure above (2.2) procurement cost increases as carrying cost increase. There is cost trade off between the two. If we add the cost graphically, we obtain a total cost curve. The optimal order quantity (Q) is the point at which annual total cost is minimum.

2.14 FIXATION OF STOCK LEVEL

2.14.1 Reorder Point

I t is the point at which the storekeeper should initiate purchase requisition for fresh supply. Whenever on item of stock touches re-order level, the purchase procedure is automatically activated so that fresh stock can be procured in time. Reorder level depends upon the lead time, rate of consumption and economic order quantity.

The reorder point is the level of inventory at which the firm places an order in the amount of economic order quantity. If the firm places the order when the inventory reaches the reorder point, the new goods will arrive before the firm's runs out of goods to sell. So, determine the reorder points under certainly, the three assumption/information are needed.

i) Usage Rate

This is the rate per day at which the item is consumed in production. It is expressed on units.

ii) Lead Time

This is the amount of time between placing an order and receiving the goods. The purchasing department usually provides this information. The time allow for order to arrive may be estimated from a check of the company's records and the time taken in the past for different suppliers to fill orders.

iii) Safety Stock Level

The minimum level of inventory may be expressed in terms of several days' sales. The level can be calculated by multiplying the usage rate the number of days that the firm wants to hold as a protection against shortage.

Reorder point under certainty

Here lead-time is the time normally taken in replenishing inventory after the order has been placed. This formula is taken under certainty condition i.e. usage and lead-time do not fluctuate.

Reorder point = Lead time × Average daily usage.

Reorder point under uncertainty

We cannot predict lead time and usage accurately. The demand for material fluctuates day to day and delivery time may be varies. If the actual usage increases delivery time delayed. The firm can faced stock out problem. To solve the stock out problem, the firm should maintain safety stock.

Reorder level can calculate by applying the following formula.

ROL = (Lead time × average usage) + Safety stock.

ROL = Minimum level + Consumption during lead time.

2.14.2 Maximum stock level

It is the quantity of material which a firm should not exceed its stocks. If the quantity exceeds maximum level limit then it will cause the over stocking. A firm should avoid over stocking because it will result in high material costs. Overstocking will mean blocking of more working capital, more space for storing the materials, more wastages of materials and more chances of loss from obsolescence.

The following is the formula to calculate the maximum stock level.

Maximum stock level = Reorder level + reordering quantity –(Minimum consumption × Minimum reorder period)

2.14.3 Minimum stock level

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

❖ Lead time
❖ Rate of consumption or daily consumption
❖ Nature of materials

Minimum stock level is calculated by using the formula:

Minimum stock level = Re-ordering level – (Average/ Normal consumption × Average /Normal lead time /Reorder period).

2.14.4 Average Stock Level

An average stock level indicated the average stock held by the firm. It is calculated by the following formula.

Average stock level = Minimum level + ½ of reorder quantity.

2.14.5 Danger stock level

This is a level of which normal issue of the material are stopped and issued are made only under specific instructions. This is the level below the minimum quantity. It is a signal to the concerned people to arrange for the procurement of materials urgently to avoid stock out. It is applying the following for formula.

Danger level = Average consumption × Maximum reorder period for emergency purchase.

2.15 ABC ANALYSIS (SELECTIVE INVENTORY CONTROL)

ABC analysis is the application of stock holding of Pareto's law, which shows that the majority of inventory value will be represent by relatively few items.

The first step in the inventory control process is classification of different type of inventories to determine the type and degree of control required for each. The ABC system is widely used classification technique to identify various items of inventory for purpose of inventory control. This technique is based on the assumption that a firm should not exercise the same degree of control on all items of inventory. "It should rather keep a more rigorous control on items that are the must costly and/or the slowest turning, while items that less expensive should be given less control effort" (Jain & Narang, 1994:112).

It is very difficult to monitor and control the enormous number of stock items. As such manufacturing organization find it useful to divide inventories into three categories for the purpose of exercising selective control on inventories. ABC analysis is a control technique that divides items into sub classification and uses different control system for each group of inventories. Under these techniques of inventory control, inventories are

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listed in A, B and C group in descending order based on money value of consumption as follows.

i) High priced inventories A

ii) Medium price inventories B

iii) Low price inventories C

The items included in-group 'A' involves largest investment and would be under tightest control by management. Therefore, inventory control should be must rigorous and intensive and the most sophisticated inventory control techniques should be apply these items. The 'C' group consists of items of inventory, which involve relatively small investment although the number of items fairly large. These items deserve minimum attention. The lower level of managers may be given authority to exercise control over these items. The 'B' group stands mid way. It deserves less attention than 'A' but more than 'C'. The 'B' items fall in between these two categories and the responsibility to control these inventories may be given to middle level managers. Employing less sophisticated techniques can control it. The typical break down of inventory item is as shown given table below.

Group	Number of items (%)	Inventory value (%)
A	15	70
B	30	20
C	55	10
Total	100	100

Figure No. 2.3: ABC Analysis

Some point stand out table given above while group 'A' is the least important in terms of the number of items, it is by far the most important in terms of the investment involved. With only 15 percent of number, it account for as much as 70 percent of total value of inventory. The firm should direct most of its control efforts to the items included in this group. The items comprising 'B' group account for 20 percent investment in inventory, they deserve less attention then 'A', but more than 'C', which involves only 10 percent total value although number-wise its share is as high as 55 percent.

2.16 REVIEW OF ARTICLES AND JOURNALS

Some studies have been made in the subject of inventory management but a few studies have been done on this matter some studies will be reviewed in this chapter:

i.   Govinda Ram Agrawal, management experts claim that inventory management in Nepal is probably the weakest aspect of management. The tools and techniques for controlling inventory have not been applied in Nepalese enterprises for controlling their physical as well as financial dimension. (Agrawal, 1980:296)

ii.   Puskar Bajracharya has conducted a study on management problem in public sector manufacture enterprises in Nepal. One of the important findings was the inventory. Their management suffers from lack of planning, high carrying cost, poor recording and stores management and virtual absences of controlling system. (Bajracharya, 1983)

iii. Rao and Jagmohan also observed that for the efficient management of inventory, there are the needs of trickling the human element the third world country like Nepal. They have suggested to orienting the attitude of the staffs towards material cost because lack of knowledge and carelessness, which were the responsible of this management of inventory. (Rao and Jagmohan, 1981)

iv.   A study relating to Nepal Transport Corporation concerning with various aspects has been made by CEDA. One of the major finding was that thought inventory management of this factor is rather simple but due to management of stocking spare parts it hampered the smooth operation of the enterprises.(CEDA,1973)

v.   Manohar Krishna Shrestha observed that agricultural input corporation often findings difficult to supply fertilizers and seeds to farmers due to lack of inventory policy to be followed by it.(Shrestha, M.K)

2.17 REVIEW OF RELATED STUDIES

Above, we have emphasized on the review of text books only but attempt is also mode to review the related studies conducted by different agencies, expert, scholars related with inventory management of manufacturing enterprises in Nepal.

Some studies have been made in the subject of inventory management but few studies are review in this chapter.

I)   **Mr. Amrit Kumar Sharma Gaire (1996 A.D):** Mr. Gaire has conducted a study on the topic of **"Inventory management: A case of Royal Drugs Ltd."**He has started some problems as quantity requirements of various inputs produced on the basis of estimation. The economic order size, price of inputs, handling charge, maintaining ordering charge etc are determined unscientifically and do not use any analytical tools to reduce unnecessary cost. The concept of optimum level of inventory is totally ignored i.e. Re-order level, minimum stock, maximum stock, safety stock etc are not taken into consideration. Another problem reflected by Mr. Gaire is lead time i.e. the gap between the placing and receiving a new order is not given proper attention.

II)   **Mr. Surendra Prasad Yadav (1999 A.D.)** has conducted the research work on the topic of "Inventory management of manufacturing public enterprises: A case study of Janakpur Cigarette Factory Ltd."He has also extracted the similar problems as by the previous writer. All the required inputs are just estimated. The concept of economic order size, price of input, handling charge and maintaining charges etc are determined unscientifically and do not use any tools and techniques or models to control inventory so that unnecessary cost can't be reduced. The concept of optimum level of inventories is not followed as a result of fixing of reorder level, minimum stock level, maximum stock level, safety stock level and danger level etc are not determined. Lead time, ordering cost and carrying costs are totally out of consideration.

III) **Indira Shrestha (2000 A.D.)** study was made on the topic of **"Inventory management of manufacturing industries of Nepal"** (with special reference to quick foods).She has depicted the same types of problems as the previous related studies. Inputs necessary to produce noodles and cheese ball are found to be estimated by the company. Economic order size, handling charge, maintaining ordering and carrying charge etc. are predetermined unscientifically and do not use any type of analytical tools which are not helping the company in reducing unnecessary cost. The concept of optimum level of inventory is not used. Re-order level, minimum stock level, safety stock level, maximum stock level and danger stock level help to maintain optimum level of inventory which are not given serious consideration while deciding the size and level of various raw materials in the factory. Lead time is also not considered.

IV) A case study has been conducted by **Surendra Shrestha (1998 A.D)** regarding **Inventory Management of Gorkha Patra Corporation.** His main objective is to find out the inventory position of the organization and to provide different suggestion regarding inventory management. He had concluded that Gorkha patra had not applied any sort of available inventory management techniques to manage the inventory. In the Gorkhapatra Corporation, it is difficult but not impossible to apply the inventory management techniques because of lack of certain data.

V) **Puspa Raj Baral (1994 A. D)** has also made study regarding **"Inventory Management: A case study of Gandaki Noodles Pvt. Ltd."**The main objectives of his study were to highlight the Company's policies and objectives, functions and activities regarding inventory management. Finally he came to know that the factory is following neither economic order quantity model in its purchasing decision nor ABC analysis in inventory management.

VI) **Radha Kumari Balika (1996)** had studied about the **Inventory Problem of Hetauda Cement Industry Limited (HCIL)** to find the present inventory position and problem in managing inventory. After his studies he revealed that there is no proper system for material purchase in the industry. And the price and quantity of collected materials are fluctuating from year ti year. The company is not following EOQ model in purchasing decision. The investment in the inventory stock of HCIL is in large amount. The value of inventory is increasing from year to year.

VII) **Soraj Rijal (1997)** has conducted the research work on the topic of **"Inventory Management: A case study of Agriculture Input Corporation (AIC)."** His main objectives are to find present inventory position of AIC, to find out inventories management techniques used by AIC and to provide optimum suggestion regarding inventory management of AIC. He observed that the Inventory Management of AIC has no been based on scientific methods adopted by modern organizations of today. For example, EOQ method, the reasonable method for calculating number of orders in a year and the size were inapplicable in AIC because of uncontrollable variables, like daily fluctuation which is to be born while importing inventory components like fertilizer, insecticides and implemements. There are also controllable variables like procurement practices, absences of different cost required for EOQ limited storage facilities with AIC. For these variables AIC seems passive to do any exercise to improved inventory management situation of AIC.

VIII) **Govinda Ram Agrawal (1980)** has made a study relating to the **Nepalese public Enterprises,** which stated that inventory management is the weakest aspect of the management. The tools and techniques for controlling inventory have not been applied in Nepalese manufacturing Enterprises for controlling their physical as well as their financial dimension.

IX) **Vijaya Sharma (1999)** on his study of **Inventory Management of AIC regarding seeds** indicates that the inventory turnover ratio is an indication of the efficiency of Management. The very low inventory turnover ratio of wheat seeds shows an inefficient inventory management system.

X) **Krishna Narayan (2000)** had conducted the study on the topic of **"Inventory Management of Royal Drug Ltd."** His study stated that to achieve the objective of Royal Drug Limited, the efficient management of inventory is essentials. He revealed that to achieve the object of Royal Drug Ltd, the efficient management of inventory is essentials. If the Royal Drug Ltd applies the scientific techniques of inventory management, certainly it will cope its objectives very successfully. He further suggested purchase plan should be prepared for different types of raw material with proper co-ordination and cooperation among the planning, purchasing, storing, producing, marketing, selling etc to avoid the excessive investment on inventory. He also recommended that for purchasing various types of raw material and inventory, the company should use scientific inventory

management techniques to minimize total inventory cost i.e. carrying and ordering cost.

XI) **Ram Saran Pandey (2000)** on his degree thesis on **Gorkhapatra Corporation** stress that for a good inventory system, to maintain suitable level of inventory, so as to able to fulfill the corporation's requirement on time. The rules for maintaining proper stocks of inputs as discusses previously are necessary to know the answer about how much to buy and when to buy. Moreover it is evident from previous discussions that the unnecessary cost involved in ordering and carrying can be reduced to a certain level by using the models, formulas, etc.

XII) **Bishnu Pradhan (2000)** has conducted a study on **Significance of Inventory Management of Nepalese Manufacturing Enterprises.** He had studied the ratio of inventories to total assets computed for selected non-financial Nepalese enterprises. One of the important findings was to invest on average, about 22 percent of total assets in the form of inventories in 2000/01 by Nepalese enterprises indicate that larger amount of money has to be invested in the form of inventory. Hence; the inventory management has greater significance.

XIII) **Saroj Sidgel (2002)** had conducted the research work regarding **"Inventory Management of Agriculture Input Corporation"** stated that AIC is not using scientific model of inventory management. Although they don't calculate EOQ for the supply of chemical fertilizer, they order lots of 1000 to 2000metric ton. There is no evidence of taking discount by AIC. Lead time is not calculated properly. Reorder point is also not fixed. Regarding buffer stock, although AIC have capacity of sufficient warehouse through out the country, it remains out of stock in season and overstock in out of season.AIC is not using ABC analysis also.

XIV) **Puskar Bajracharya (1983)** has conducted his study on **Management in Public Sector Manufacturing Enterprises in Nepal.** The main objectives of his study are to find out the different problems faced by public sector manufacturing organization in Nepal. One of the important findings was the inventory management suffers from the lack of planning ,high carrying cost, poor record keeping and stores management and virtual absences of controlling system.

XV) **Krishna Kumar Bhattrai (2002)** had conducted the study on the topic of **"Inventory Management system: A case study of Gorkhapatra Corporation."** He has found that the corporation is not following any systematic tool and techniques to control and manage inventory systematically even the

corporation is running in profit although amount of profit is in decreasing trend. The corporation is importing lower and lower quantity of newsprints year after year. It seems that demand of newspapers decreasing due to severe competition.

Due to lack of sufficient data, models, examples, formulae etc could not be used fully to ascertain the necessary operation of the corporation. No techniques for inventory management are used to obtain the major decision when to buy because of the lack of planning and unsystematic methods of receiving cost.

2.17   RESEARCH GAP

Although there are various studies related to inventory management regarding different organizations and available in different libraries, but review literature indicates that there are few studies devoted to inventory in Nepalese context. These few studies conducted earlier have now needed to carry out a study to assess the recent development in inventory management. This study covers the data of five years. Nobody of the earlier studies had focused on role of inventory in over all profit planning of the organization although inventory and different components of profit planning like production planning, purchase planning etc are closely related to each other. Similarly nobody had shown the relationship of inventory with sales, production and purchase although they are closely related to each other. Moreover this study has not been done by previous researcher as separately. Further no one had tested the correlation of different parts of the inventories using data of 2061 to 2066B.S. Further here the researcher has analyzed the t-test of correlation of coefficient. Thus, to fill the gap, this study has been conducted. Thus this study will be milestone in the field of inventory management and control in Unilever Nepal Ltd. In spite of above, multiple gaps among the researcher's view as well as there is time gap regarding the study of inventory management.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1   INTRODUCTION

It is a systematic path or way to solve about the arising research problem. It is the process of solution the arising problem through the planned and systematic dealing with the collection of data and interpretation of data for fact & figure. The basis objective of the study is to analyze the inventory management of Unilever Nepal Ltd. and its impact on profitability. To achieve the objectives, the study needs appropriate research methodology in systematic and scientific manner.

The study is try to focus how the effective inventory management system is implemented in systematically and scientifically so the organization easier to control the inventory & easy to minimize the cost of inventory. For the purchase of achieving the objectives, the organization uses the following research methodologies which are research design, nature and sources of data, data collection& techniques of analysis. And finally different statistical and mathematical tools were used to analyze the relevant information.

3.2   RESEARCH DESIGN

This study is entitled; "Inventory management and its impact on profitability of Unilever Nepal Ltd." This study deals with Unilever Nepal Ltd. Only material collection, consumption and inventory position of products groups are variables under the study. This study is based on primary as well as secondary data. Some simple statistical methods such as trend line and correlation analysis have been applied to examine the facts of data.

3.3   NATURE AND SOURCES OF DATA

Information is lifeblood of any research. Both primary and secondary information have been used in this study. Primary information is based on questionnaire, informal interview as well as unstructured dialogues and discussions with the officials of Unilever Nepal Ltd. The required data and information for analysis are directly collected

from the annual reports of UNL, direct contact to UNL corporate office. Supplementary data and information are collected from number of institution like Shanker Dev Campus Library, T.U. Central Library and Documentation section of T.U. Library, UNL Corporate office etc.

Secondary data have been collected from the following sources.

- Report and Financial statement of the company.
- Published and unpublished official records.
- Books, articles, magazine, annual report etc.

All the data are complied, processed and tabulated in the time series as per the need and objectives. Formal and informal talks to the concerned persons of the department of the bank were also helpful to obtain the additional information. Similarly; various data and information are collected from the economic journals, bulletins, magazines etc.

3.4   DATA GATHERING PROCEDURE

The secondary data are directly obtained from various sources mentioned above for the purposes of data analysis are taken from official records, websites. The researcher had to visit the head office of Unilever Nepal Ltd and get data from the records.

For primary information, with the view of collecting the additional information, informal interviews with the officials have been taken. All the gathered data have been used according to need and requirement of the study.

3.5   PRESENTATION AND ANALYSIS OF TECHNIQUE AND TOOLS

To analyze the collected facts and figures, various accounting tools are used to effectiveness of inventory management and control wherever necessary. The techniques included are statistical tools, graphs, Karl Pearson coefficient and correlation. And the inventory management techniques applied in this study is EOQ, different stock levels, Inventory turnover ratio and ABC analysis.

To achieve the objectives of the study, various financial as well as statistical tools have been used in this study. The analysis of data will be done according to pattern of data

available. Because of limited time and resources, some simple analytical statistical tools such as percentage change, coefficient of correlation and method of least square are adopted in this study. Similarly, some strong accounting tools such as ratio analysis and trend analysis have been used for financial analysis.

3.5.1   STATISTICAL TOOLS

Some important statistical tools are used to achieve the objective of this study. In this study, statistical tools such as coefficient of correlation analysis, standard deviation, coefficient of variance and t-test have been used.

Coefficient of Correlation

This analysis identifies and interprets the relationship between two or more variables. In this case of highly correlated variables, the effect on one variable may have effect on other correlated variable. Under this topic, Karl Pearson's co-efficient has been used to find out the relationship between the different variables. The formula for computing Person's correlation coefficient (r) using direct method is as follows:

$$r = \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - \left(\sum x\right)^2}\sqrt{N\sum y^2 - \left(\sum y\right)^2}}$$

Where,

       X = Dependent variable

       Y = Independent variable

       r = correlation coefficient

       N = No of time period

3.5.2   FINANCIAL TOOLS

Percentage Analysis

This ratio is calculated to measure the acceleration or retardation of any variable to the company in each year. This helps the bank to identify the degree how the variable is

moving in each year. It also helps the organization to take the suitable direction. It is calculated in following way:

$$\text{Annual percentage change} = \frac{\text{Amount of this year} - \text{Amount of last year}}{\text{Amount of last year}}$$

Major tools for Analysis:

- ABC Analysis
- EOQ Analysis
- Different Turnover ratios(Inventory Turnover ratio, R/M turnover ratio, Finished goods Turnover ratio etc)
- Different statistical tools like (Mean, Standard Deviation, Coefficient of correlation, Coefficient of variation and t-test etc).

CHAPTER FOUR

4. PRESENTATION AND ANALYSIS OF DATA

The main objective of this study is to examine the present practice of inventory management system in UNL. To achieve the said objective, collected data are analyzed in this chapter by applying inventory management tools and technique.

On the basis of official recorded data of UNL, the researcher has tried to explore the existing problem of inventory management and control system and the researcher has to analysis and diagnosis of the collected data and to provide the suggestion and recommendation to the UNL.

4.1   PURCHASING PROCEDURE PRACTICE IN UNL

Purchasing is the first important function of inventory management in any manufacturing company. So, UNL also requires different types of raw material such as oils, lauric acid, caustic soda, sorbitol, salt, palm, fatty acid, sulphuric acid, galaxy, chira clay, etc for the production of different types of products.

UNL needs regular supply of different types of raw materials and WIP materials (soap noodles) for the continuous production operation. Required raw materials for the factory are purposed by using following purchasing procedures.

4.1.1   Collection of Requisition

Purchasing manager of purchasing department of UNL collects the purchase requisition slip from the store department for all items.

4.1.2   Decision for purchase

When the purchase requisition is received by the purchasing manager, then he/she decides what, when and how much to buy.

The level of purchasing of raw materials directly affects the investment on inventory and cost associated with inventory, which ultimately affects the profitability rate of the company. So, the company should determine appropriate purchase quantity of raw

materials to minimize the investment on inventory and cost associated with it. To cope with this situation the company may apply the EOQ model to determine the appropriate purchase quantity of material. But in UNL, EOQ model of purchase management is not in practice.

4.1.3   Selection of suppliers

UNL is a subsidiary company of Hindustan Lever Ltd. So, the requirements of all materials are purchased from Hindustan Lever Ltd of India. Therefore, UNL has adopted centralized purchasing procedure.

4.1.4   Purchase Order

In case of centralized purchasing, UNL purchasing department prepares orders and sends to the Hindustan Lever Ltd (HLL) to supply a specific quality and quantity of materials at the stipulated terms at the time and place mentioned.

4.1.5   Receiving and Inspection of materials

When materials are arrived then they are received and checked by receiving clerk against the order placed by the purchasing department to vendor. After proper checking, materials are delivered to the store department for checking, if any discrepancy is found regarding the quality and quantity, it is immediately sent to the purchasing department to adjust the discrepancy. Since the company is purchasing raw materials from HLL, there are no discrepancy regarding quality and quantity.

4.2   STORE CONTROL DEVICE

The raw materials are received by the purchasing department, and then all items received by the purchasing department should be passed into store for protection against deterioration and pilferage. To minimize the cost of holding materials in store all companies generally use different types of controlling devices like Bin cards and store ledger. But the UNL uses Bin cards. A bin card makes a record of the receipt and issues of materials. A Bin card is kept for each item store carries. These cards are maintained by

the storekeeper and storekeeper is accountable for any difference between the physical stock and balance shown in bin card. These cards are used not only for recording receipts and issues of stores but also for assist the storekeeper to control the stock.

For each items of store, minimum quality, maximum quantity and ordering quantity are stated on the card. By seeing the bin card the storekeeper can send the material requisition for the purchase of materials in time.

4.3   ISSUING AND PRICING

The pricing of the issues can be determined by values as per weighted average method at the lower cost or market price.

4.4   PRESENTATION INVENTORY POSITION OF UNL

4.4.1   Relation between Inventory and Current Assets

Table 4.1

Relation between Inventory and Current Assets

Fiscal year	Inventory(in million)	Current assets (in million)	% of inventory on total current assets
2061/2062	144.46	399.14	36.19
2062/2063	126.11	589.88	21.37
2063/2064	184.22	724.42	25.54
2064/2065	229.76	891.41	25.77
2065/2066	256.17	741.6	34.54
Average	**188.14**	**669.29**	**28.11**

Source: Annual Reports of UNL

Note: % of inventory on current assets = $\dfrac{\text{Inventory}}{\text{Current Assets}}$

: Average = $\dfrac{\text{Sum of the figure of overall study period}}{\text{No of the period}}$

From the above table, it is observed that, the inventory to current assets ratio during the study period is 36.19 % in FY 061/062,21.37% in FY 062/063, 25.54 % in FY 063/064,25.77 % in FY 064/065,and 34.54% in FY 065/066.Similarly,average inventory in an overall study period is Rs 188.14 million, average current assets in an overall study

period is Rs 669.29 million and average percentage of inventory in an overall study period has been 28.11 percent.

From the above analysis, it is observed that the share of inventory on total current assets is highest in FY 061/062, i.e. 36.19 percent and lowest in FY 062/063, i.e. 21.37 percent. This results shows that the company has not defined an appropriate share of inventory in current assets. The huge amount of inventory is beneficial to the company if market price is in increasing trend and vice-versa.

The graphic presentation of level of inventory and current assets is as follows:

Figure No. 4.1

Level of Inventory and current assets
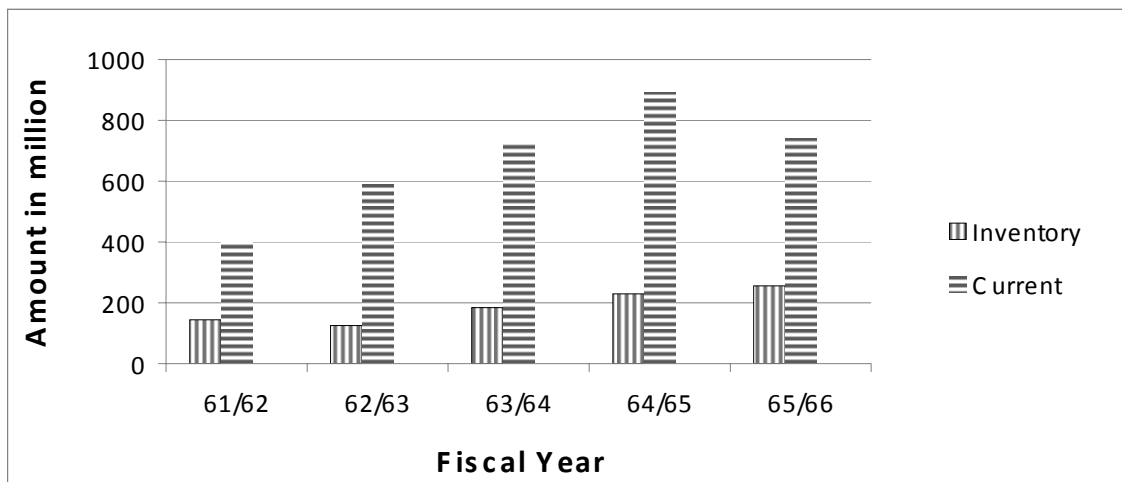
Figure 4.2

Level of inventory and current assets
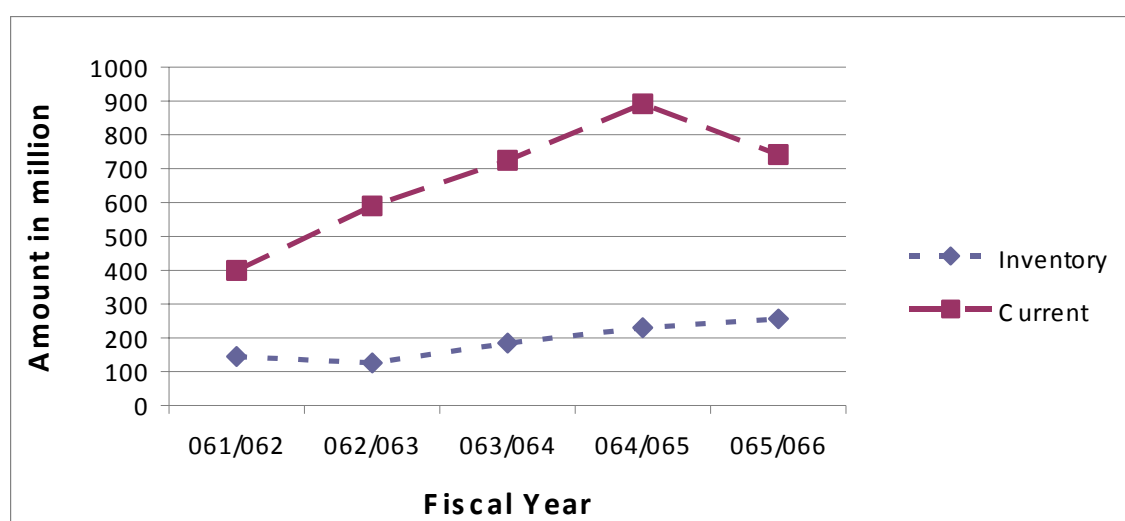
4.4.2 Proportion of Raw material on Total inventory

Table 4.2

Proportion of Raw material on Total inventory

Fiscal Year	Raw material (in million)	Inventory (in million)	% of raw material on total inventory
061/062	64.06	144.46	44
062/063	59.2	126.11	46.94
063/064	95.28	184.22	51.72
064/065	124.52	229.76	54.19
065/066	92.94	256.17	36.28
Average	**87.2**	**188.14**	**46.35**

Source: Annual Report of UNL.

Note: % of raw material on inventory = $\dfrac{\text{Raw Material}}{\text{Inventory}}$

: Average = $\dfrac{\text{Sum of the figure of overall study period}}{\text{No of the period}}$

UNL has been using different types of chemicals and perfumes; that constitute the major portion of raw materials on total inventory in UNL.

From the above table 4.2, it is observed that, the raw material on total inventory during the study period is 44 % in FY 061/062, 46.94 % in FY 062/063, 51.72% in FY 063/064, 54.19% in FY 064/065 and 36.28 % in FY 065/066.

Similarly average inventory in overall study period is Rs 188.14 million, average inventory of raw materials in overall study period is Rs 87.2 million and average percentage of raw material in total inventory in overall study period is 46.35 percent.

From the above analysis, it is observed that raw material consumption in the company is erratic. The fluctuation in stock of raw material during the study period is very high. Defective purchasing policy and poor planning of raw material may be responsible factors for such fluctuation. The large amount of raw materials in inventory is beneficial to the company if market price of raw material is in increasing trend and vice-versa.

The graphic preparation of level of raw materials on total inventory is as follows:

Figure No. 4.3

Level of Raw Materials on Total Inventory

Figure No 4.4

Level of raw material on Total inventory
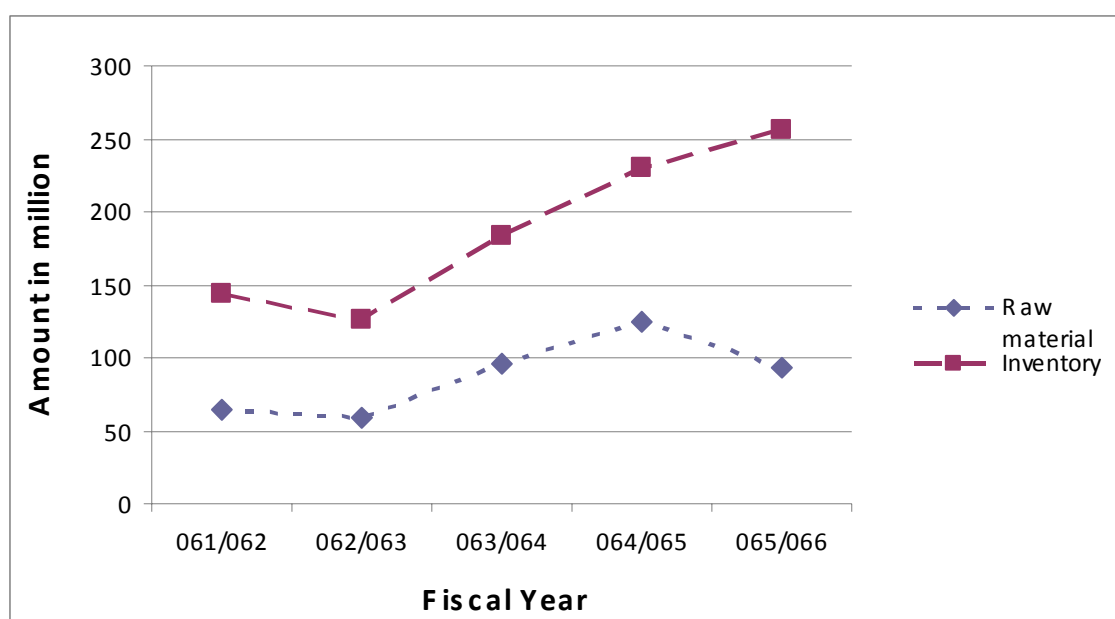
4.4.3 Proportion of Packaging Material on Total Inventory

Table 4.3

Proportion of Packaging Material on Total Inventory

Fiscal Year	Packaging material (in million)	Inventory (in million)	% of packaging material on total inventory
061/062	21.3	144.46	14.7
062/063	11.5	126.11	9.00
063/064	21.76	184.22	11.81
064/065	23.40	229.76	10.18
065/066	32.21	256.17	12.57
Average	**22.03**	**188.14**	**11.71**

Source: Annual Reports of UNL.

Note: % of packaging material on total inventory = $\dfrac{\text{Packaging material}}{\text{Inventory}}$

: Average = $\dfrac{\text{Sum of the figure of overall study period}}{\text{No of the period}}$

From the above table 4.3, it is observed that the share of packaging material on total inventory during the study period is 14.70 percent in FY 061/062, 9 percent in FY 062/063, 11.81 percent in 063/064, 10.18 percent in FY 064/065, 12.57 percent in 065/066.

Whereas the average percentage of packaging material in total inventory in overall studies period is 11.71 percent. Similarly average inventory in overall study period is Rs 188.14 million, average inventory of packaging materials in overall study period is Rs 22.03 million.

From the above analysis, it is observed that the share of packaging material in the company is erratic. This result shows that there is no fixed policy of purchasing of packaging material. It is because that the company might have forecasted higher level of sales volume by looking at the gradually increasing trend of sales volume in previous year.

The graphic presentation of level of raw materials on total inventory is as follows:

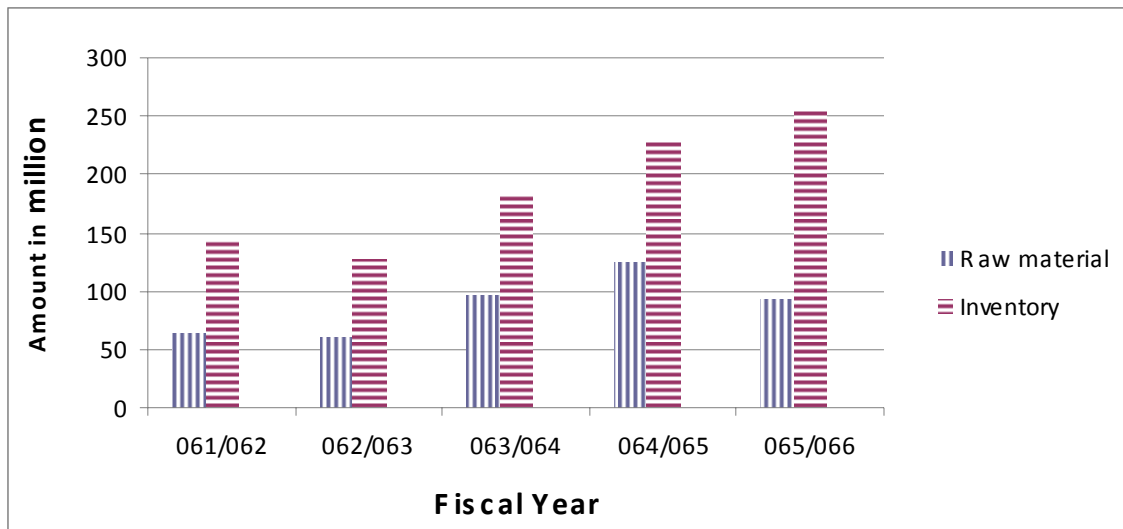**Figure No. 4.5**

Level of packaging materials on total inventory

Figure No. 4.6

Level of packaging materials on total inventory

4.4.4 Proportion of WIP Materials on Total Inventory

Table 4.4

Proportion of WIP Materials on Total Inventory

Fiscal Year	WIP Materials (in million)	Total inventory (in million)	% of WIP on total inventory
061/062	6.30	144.46	4.40
062/063	4.02	126.11	3.20
063/064	5.52	184.22	2.99
064/065	3.49	229.76	1.52
065/066	7.68	256.17	3.00
Average	**5.40**	**188.14**	**2.87**

Source: Annual Reports of UNL.

Note: % of WIP Materials inventory on total inventory = $\dfrac{\text{WIP materials}}{\text{Total Inventory}}$

$$: \text{Average} = \frac{\text{Sum of the figure of overall study period}}{\text{No of the period}}$$

UNL has been using soap noodles to produce the final product. The smaller portion of WIP on total inventory is used by the company.

From the above Table 4.4, it is observed that the portion of WIP material on total inventory during the study period is 4.40 percent in the FY 061/062, 3.20 percent in the FY 062/063, 2.99 percent in the FY 063/064, 1.52 percent in the FY 064/065, and 3.00 percent in the FY 065/066.

Whereas the average percent of WIP materials in total inventory in overall study period is 2.87 percent. Similarly average inventory in overall study period is Rs 188.14 million, average inventory of packaging materials in overall study period is Rs 5.40 million.

From the above analysis, it is observed that WIP materials of the company are fluctuating during the study period. Such fluctuation in inventory position is not considered as good from the point of view of inventory management. Fluctuation in demand and sales of company products, lack of appropriate inventory policy and ineffective demand forecast are the main reasons of such fluctuation.

The graphic presentation of level of WIP materials on total inventory is as follows:

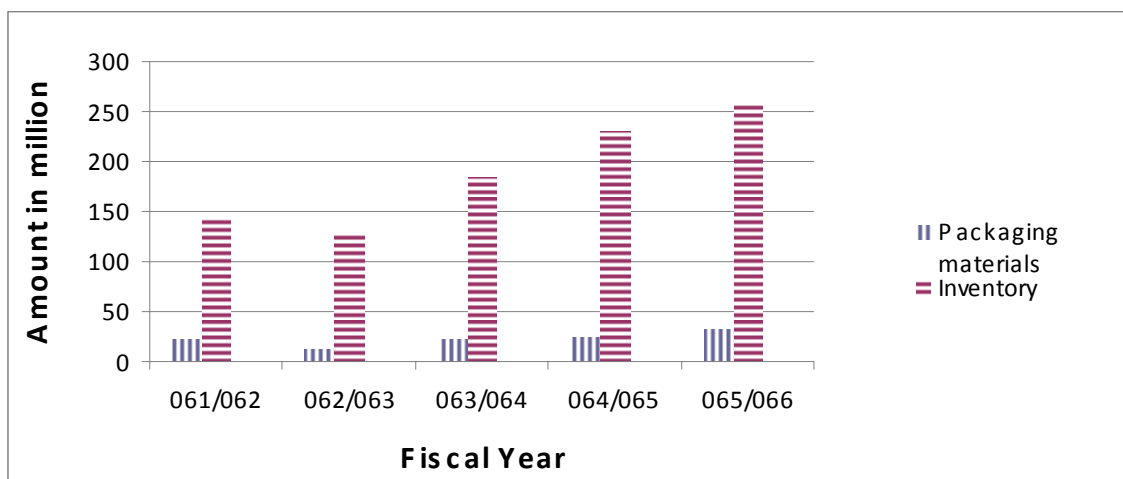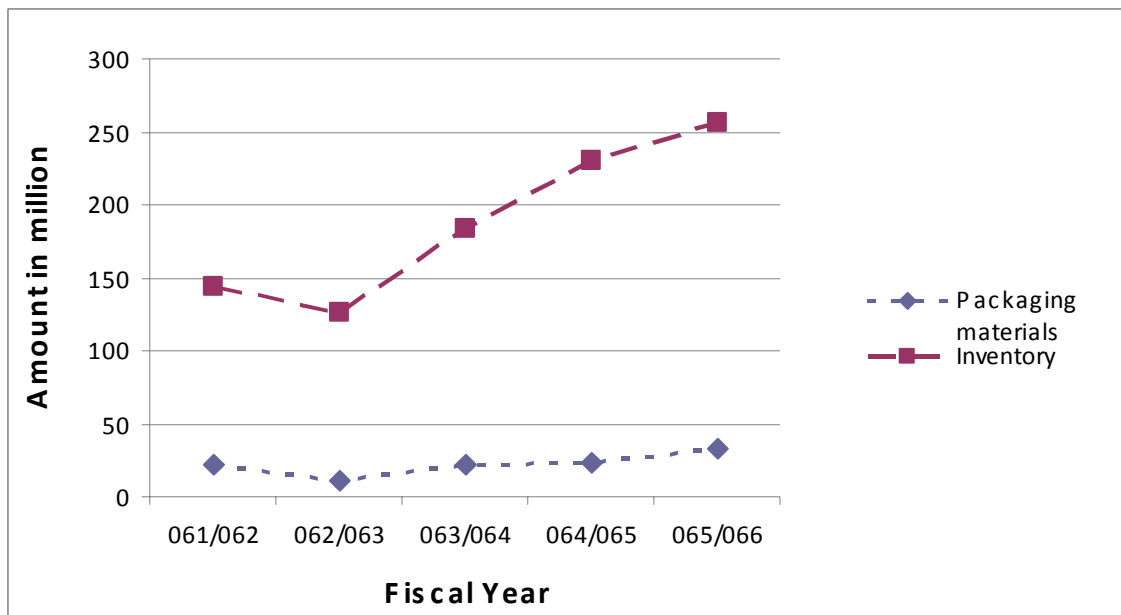**Figure No. 4.7**

Level of WIP Materials on Total Inventory
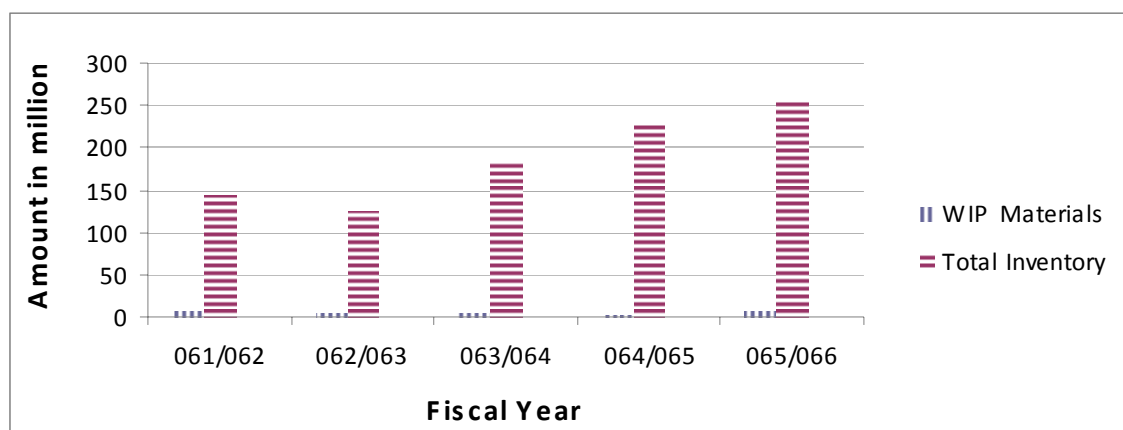
Figure No. 4.8

Level of WIP materials on total inventory
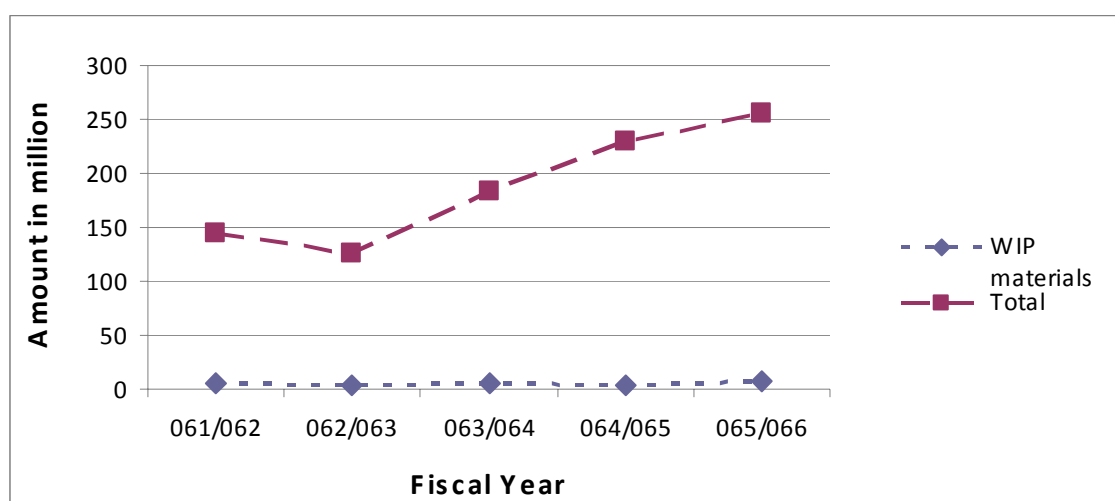
4.4.5 Proportion of Finished Goods on Total Inventory

Table 4.5

Proportion of Finished Goods on Total Inventory

Fiscal Year	Finished Goods (in million)	Total inventory (in million)	% of Finished goods on total inventory
061/062	41.30	144.46	28.60
062/063	44.50	126.11	35.30
063/064	55.50	184.22	30.13
064/065	73.83	229.76	32.13
065/066	116.35	256.17	45.42
Average	**66.30**	**188.14**	**35.24**

Source: Annual Reports of UNL.

Note: % of finished foods inventory on total inventory = $\dfrac{\text{Finished goods inventory}}{\text{Inventory}}$

: Average = $\dfrac{\text{Sum of the figure of overall study period}}{\text{No of the period}}$

UNL has been producing different kinds of products and product groups namely, detergents, toilet soaps, oral care, scourers, skin creams, laundry soaps, hair care etc.

From the above Table 4.5,it is observed that the portion of finished goods on total inventory during the study period is 28.60 percent in the FY 061/062, 35.3 percent in the FY 062/063, 30.13 percent in the FY 063/064, 32.13 percent in the FY 064/065, and 45.42 percent in the FY 065/066.

Whereas the average percentage of finished goods inventory in total inventory in overall study period is 35.24 percent. Similarly, average inventory in overall study period is Rs 188.14 million, average inventory of finished goods in overall study period is Rs 66.30 million.

From the above analysis, it is observed that the production rate was increasing from the FY 061/062 to FY 062/063. In that period contribution raw material and packaging material was also in increasing trend. But from as the FY 062/063 to FY 063/064, the production rate was in decreasing trend. Fluctuation of demand and sales of the company are the main reasons of such situations.

The graphic presentation of level of finished goods on total inventory is as follows:

Figure No. 4.9

Level of Finished Goods on Total Inventory
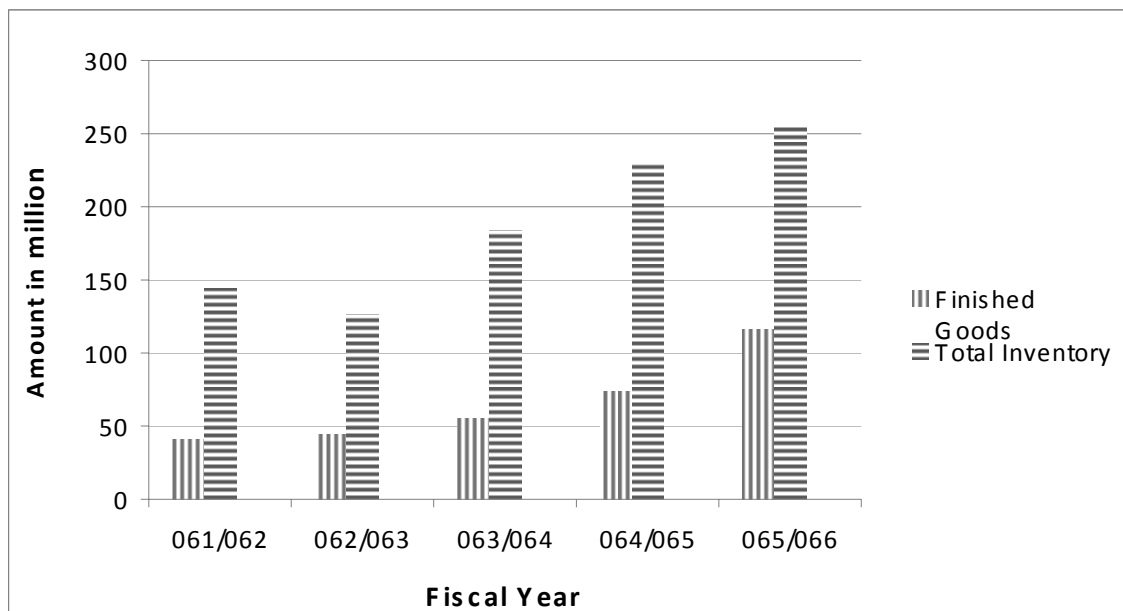
Figure No. 4.10

Level of Finished Goods on Total Inventory
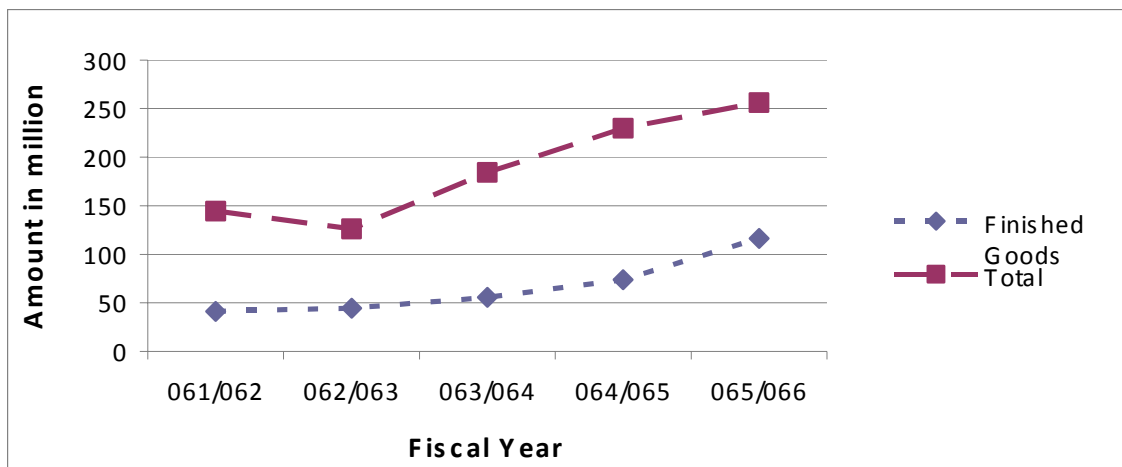
4.4.6 Proportion of Stores and Spare Parts on Total Inventory

Table 4.6

Proportion of Stores and Spare Parts on Total Inventory

Fiscal Year	Store and Spare parts (in million)	Total Inventory (in million)	% of Store and Spare Parts on Total Inventory
061/062	11.50	144.46	7.90
062/063	6.90	126.11	5.50
063/064	6.15	184.22	3.34
064/065	4.52	229.76	1.97
065/066	6.98	256.17	2.72
Average	**7.21**	**188.14**	**3.83**

Source: Annual Reports of UNL.

Note: % of stores and spares parts on total inventory = $\dfrac{\text{Stores and Spare Parts in Rs.}}{\text{Total Inventory in Rs.}}$

: Average = $\dfrac{\text{Sum of the figure of overall study period}}{\text{No of the period}}$

Stores and spare parts are not directly entered production and it facilitates the smooth production process. Store and spare parts are comparatively less and don't require significant investment.

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From the above Table 4.6, it is observed that the portion of stores and spare parts on total inventory during the study period is 7.9 % in the FY 061/062, 5.5 % in the FY 062/063, 3.34 % in the FY 063/064, 1.97 % in the FY 064/065, and 2.72 % in the FY 065/066.

Whereas the average percent of stores and spare parts inventory in total inventory in overall study period is 3.83 percent. Similarly average inventory in overall study period is Rs 188.14 million, average inventory of stores and spare parts in overall study period is Rs 7.21 million.

From the above analysis, it is observed that, the quantity of stores and spare parts used by the company is irregular during the study period. Since the company's production is totally dependent on stores and spare parts, it obviously fluctuates over the study period.

The graphic presentation of level of stores and spare parts total inventory is as follows:

Figure No. 4.11

Proportion of Stores and Spare Parts on Total Inventory
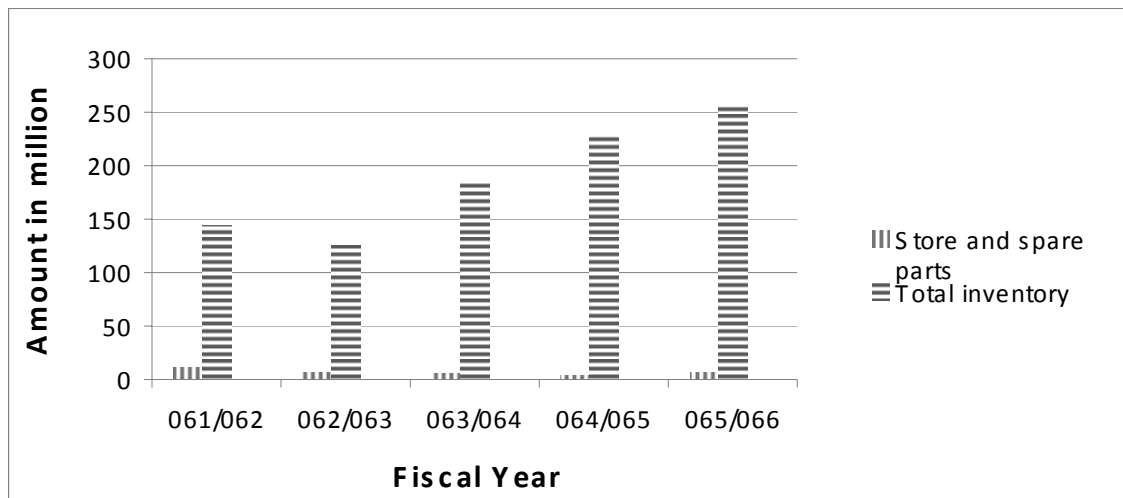
Figure No. 4.12

Proportion of spare parts on total inventory
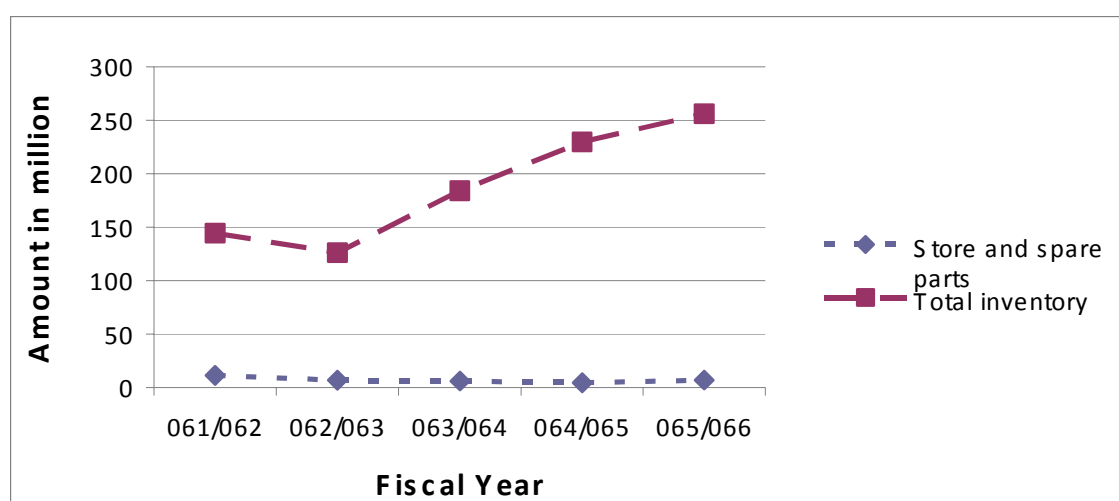
4.4.7 Relation between Sales and Net profit

Table 4.7

Relation between Sales and Net profit

Fiscal Year	Sales(in million)	% Deviation on an average sales	Net profit (in million)	%Deviation on an average net profit
061/062	1236.45	(11.18)	42.60	(69.74)
062/063	1244.73	(10.58)	93.20	(33.80)
063/064	1524.90	9.53	140.78	0
064/065	1484.89	6.66	189.19	34.38
065/066	1469.69	5.57	235.16	69.16
Average	**1392.13**	**-**	**140.79**	**-**

Source: Annual Reports of UNL.

Note: The figures in brackets are negative.

% Deviation on average sales =

Sales in given fiscal year – average sales in overall study period
_____
Average sales in overall study period

% Deviation on average net profit =

Net Profit in given fiscal year – average net profit in overall study period
_____
Average net profit in overall study period

The above Table 4.7 shows the relation between sales and net profit from the FY 2061/2062 to FY 2065/2066. From the above table, it is observed that the average sales and net profit during the study period are Rs. 1392.13 million and Rs. 140.79 million respectively. Similarly, the above table shows the percentage deviation of sales and net profit over the study period. The highest positive deviation from the average sales is 6.66 percentage in the FY 2064/2065, and the highest positive deviation from an average net profit is 69.16 percent in the FY 2065/2066.Similarly, the highest negative deviation from an average sales is (11.18) percent in the FY 2061/2062, and the highest negative deviation from an average net profit is (69.74) percent in the FY 2061/2062.

From the above analysis, it is observed that in FY 2061/2062 sales was Rs.1236.45 million and in that year, the company incurred Rs. 42.6 million profits and from FY 2061/2062 to FY 2065/2066 net profit is in increasing trend. Similarly, in the FY 2061/2062 and 2063/2064 the sales is in increasing trend. And from the FY 2064/2065 to FY 2065/2066 sales is in decreasing trend. In FY 2065/2066 sales amounted to Rs. 1469.69 million and net profit increased is increased to 238.16 million.

From the above table it can be seen that with the increase in sales in FY 2063/2064 net profit also increases to Rs. 140.78 million. But during the FY 2065/2066 with the decrease in sales there is rise in net profit. This might be due to good management.

The correlation between sales and net profit has been observed to be 0.7861, which is shown in Annex 'A'. Therefore there is significant relationship between sales and net profit. Therefore, it is concluded that the change in sales results in the change of net profit.

4.4.8 Relation between Inventory and Net Profit

Table 4.8

Relation between Inventory and Net Profit

Fiscal Year	Inventory (in million)	% Deviation on an average inventory	Net Profit (in million)	% Deviation on an average net profit
061/62	144.46	(23.22)	42.6	(69.74)
062/63	126.11	(32.97)	93.2	(33.80)
063/64	184.22	(2.08)	140.78	0
064/65	229.76	22.12	189.19	34.38
065/66	256.17	36.16	238.16	69.16
Average	**188.14**	**-**	**140.79**	**-**

Source: Annual Reports of UNL.

Note: The figures in brackets are negative.

% Deviation on average net profit =

Net profit in given fiscal year – average net profit in overall study period
Average net profit in overall study period

% Deviation on average Inventory =

Inventory in given fiscal year – average inventory in overall study period
Average inventory in overall study period

The above table 4.8 shows the relation between inventory and net profit from the FY 2061/62 to 2065/66. From the above it is observed that the average inventory during the study period is Rs. 188.14 million and the average net profit the study period is Rs. 140.79 million. Similarly, the above table shows the percentage deviation of inventory and net profit over the study period. The highest positive deviation from the average inventory is 22.12 percent in the FY 2064/65 and the highest positive deviation from the average net profit is 69.16 percent in the FY 2065/66.Similarly, the highest negative deviation from the average inventory is (32.97) percent in the FY 2062/63, and the highest negative deviation from the average net profit is (69.74) percent in the FY 2061/62.

From the above analysis, it is observed that inventory and net profit were fluctuating during the study period. Therefore there is no specific policy of investment on inventory and inventory management system.

The correlation between inventory and net profit has been observed to be 0.9337 which is shown in Annex 'B'. Therefore, there is positive and high degree of correlation between inventory and net profit.

Test of Significance of correlation coefficient

To test the significant of correlation of coefficient we can use T statistic. Here sample size is less than 30 so we can use T statistics.

Here,

$$r = 0.9337$$

$$\text{T statistic} = r\sqrt{\frac{(n-2)}{1-r^2}}$$

Null Hypothesis (Ho) $= 0$ i.e. 'r' is not significant.

Alternative Hypothesis $\neq 0$ i.e. 'r' is significant.

Now, test statistic

$$T = r\sqrt{\frac{(n-2)}{1-r^2}}$$
$$= 0.9337\sqrt{\frac{(5-2)}{1-0.9337^2}}$$
$$= 4.52$$

Now tabulated value of t for (n-2), i.e. 5-2=3 degree of freedom for two-tail test at 5% level of significance is 3.182.

Decision

Since calculated /t/ is $>$ tabulated value of /t/ at 3 degree of freedom at 5% level of significance we reject Ho and we accept H1, which indicate that correlation coefficient between variables are significant or 'r' is significant. This t tests proves that there is relation between inventory and net profit.

4.5 RATIO ANALYSIS OF UNL

Ratio analysis is a technique of analysis and interpretation of financial statement through mathematical expression. It may be defined as the mathematical expression of the relationship between two accounting figures. To evaluate the different performances of an organization by creating the ratios from the figures of different accounts is termed as "Ratio Analysis". In short, ratio analysis can be defined as an analysis of financial statements with the help of ratios.

Inventory ratio analysis of any organization may help to know the efficiency of management of finished goods. Inventory turnover ratio is also known as stock turnover

ratio or sales stock ratio. This ratio measures turnover of stocks in terms of time. The higher the turnover is better the efficiency.

4.5.1 Relation between Sales and Inventory

Table 4.9

Inventory Turnover Ratio

Fiscal Year	Sales(in million)	Inventory(in million)	Inventory Turnover Ratio (times)
2061/62	1236.05	144.46	8.56
2062/63	1244.73	126.11	9.87
2063/64	1524.90	184.22	8.28
2064/65	1484.89	229.76	6.46
2065/66	1469.69	256.17	5.74
Average	**1392.05**	**140.87**	**7.78**

Source: Annual Report of UNL.

Note: Inventory Turnover Ratio = $\dfrac{Sales}{Inventory}$

% Deviation on average Inventory turnover Ratio **=**

$$\dfrac{\text{Inventory Turnover in fiscal year} - \text{average inventory turnover ratio overall study period}}{\text{Average inventory turnover ratio in overall study period}}$$

From the above Table 4.9, it is observed that in the FY 2062/63 the inventory turnover ratio is highest i.e. 9.87 times. So, in this year, low level inventory is kept in the company due to fast consumption and sales of raw materials and finished goods. In the FY 2065/66, the inventory turnover ratio is the lowest, i.e. 5.74 times. Decrease in inventory turnover shows decrease in sales so, low inventory is not beneficial for the company UNL. The appropriate ratio in inventory turnover is 6.46 to 9.87 times because huge inventory is better for the company.

The correlation between inventory and sales has been observed to be positive i.e. 0.7954, which is shown in Annex 'C'. Therefore, there is significant relationship between inventory and sales. Therefore, it is observed that changes in inventory emulate from changes in sales.

4.6 INVENTORY MANAGEMENT AND CONTROL TECHNIQUES

4.6.1 Economic Order Quantity Calculation

4.6.2 Economic Order Quantity of RM on FY 2061/62

The optimal level of raw material has been determined by the application of "Economic Order Quantity" model.EOQ can be calculated by using three methods.

1) Formula Method
2) Tabular Method (trial and error method)
3) Graphical Method

1) Formula Method

Under this method, EOQ can be calculated as follows:

Raw Materials: [Chemicals and Perfumes]

On the basis of company's records, the following data are available.

Total Raw Material Consumed (A) = 17665 tones.

(Annual Requirement)

Carrying cost per tones (C) = Rs. 1373.

Ordering cost per order (O) =Rs. 109094.

Note:

- Calculation of carrying cost is based on godown rent, insurance, electricity and security.
- Ordering cost is based on data provided by the corporate office by direct personal interview.

By applying the EOQ formula,

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 17665 \times 109094}{1373}} = 1675 \text{ tones}$$

(i) EOQ = 1675 tones

(ii) No. of orders = $\dfrac{\text{Annual Requirement}}{\text{EOQ}}$

$$= \frac{17665}{1675}$$

$$= 10.54 \approx 11 \text{ times.}$$

From the above calculation, the EOQ is 1675 tones, which minimizes the total cost of carrying and ordering with the no. of order 11 times, which is also clear from the tabular method given below:

2) **Trial and Error Approach (Tabular Method)**

Table 4.10

Trial and Error Approach of EOQ (Tabular Method) of FY 2061/62

No. of orders	Order size (tones)	Average inventory(tones)	Total carrying cost(Rs.)	Total ordering cost (Rs.)	Total cost (Rs.)
1	17665	8832	12126336	109094	12235430
5	3533	1766	2425267	545470	2970737
7	2523	1262	1732334	763658	2495992
10	1766	883	1212633	1090940	2303573
11	1605	802	1102394	1200034	2302428
13	1358	679	932795	1418222	2351017

Source: Annual Report of UNL.

The above table shows that the carrying cost is decreasing and ordering cost is increasing with the increasing number of order. The above table shows the minimum total cost of RM is Rs. 2302428.Where the total carrying cost is Rs. 1102394 and the total ordering cost is Rs. 1200034 with the number of order 11 times per year. So, it is clear that, if the company wants to minimize total cost of inventory of RM it should order 11 times during the year.

So, it becomes clear from formula as well as tabular method, that the company should order 1675 tones with 11 times during the year.

3) Graphical Method:

Under this method carrying cost and ordering cost are plotted in graphs and the point, where carrying cost and ordering cost is equal that quantity is taken as EOQ.

Graphical presentation of EOQ is as follows:

Figure No. 4.13

Graphic presentation of EOQ
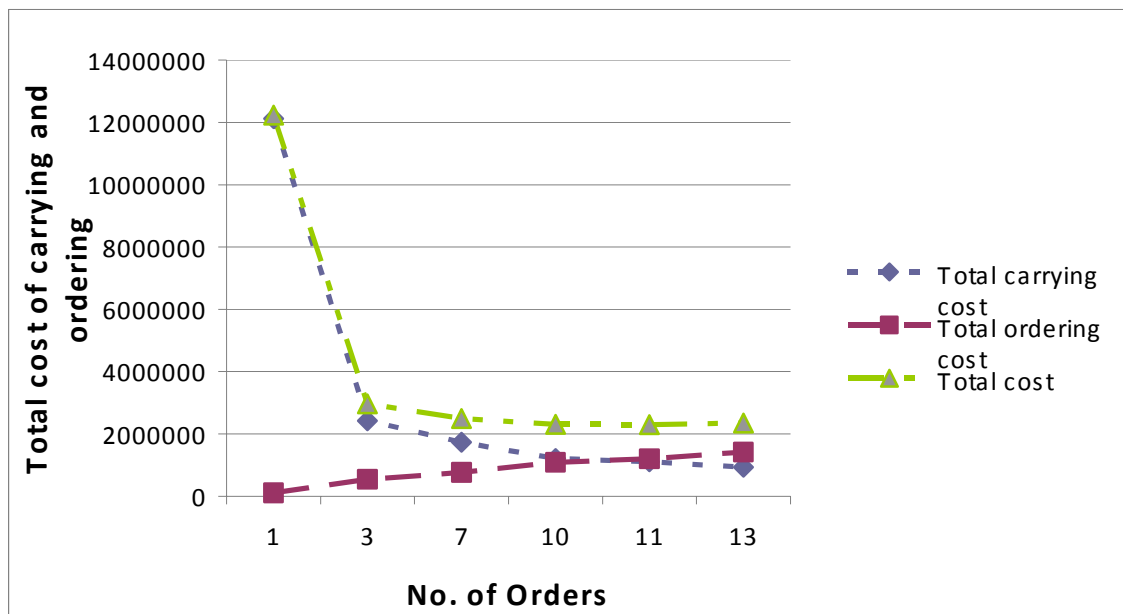
The above table 4.10 and figure number 4.13 shows the minimum carrying cost and ordering cost, which minimizes the total cost. OX axis denotes the number of orders and OY axis denotes the total cost of ordering and carrying. Ordering cost is going upward and carrying cost is going downward. When order size is increasing, the carrying cost is decreasing and ordering cost is increasing.

From the above calculation, it is clear that by using the tabular method the minimum total cost is Rs. 2302428, where total carrying cost is Rs. 1102394 and total ordering cost is Rs. 1200034 with the no. of orders is 11 times per year. So, it is clear that if the company wants to minimize total inventories of raw material cost it should order only 11 times during the year.

So, it becomes clear from the formula method, tabular method as well as graphical method, the company should order 1675 tones with 11 times during the year.

4.6.3 Economic Order Quantity of RM on FY 2062/63.

Annual Requirement (A) = 17362 tones.

Ordering cost per order (O) =Rs. 108472.

Carrying cost per tones (C) = Rs.1123 per tones.

By applying EOQ formula,

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

$$= \sqrt{\frac{2 \times 17362 \times 108472}{1123}}$$

=1831 tones

(i) EOQ = 1831 tones.

(ii) No. of orders = $\dfrac{\text{Annual Requirement}}{\text{EOQ}}$

$$= \frac{17362}{1831}$$

= 9.48 times ≈ 9 times approx.

From the above calculation, the EOQ is 1831 tones under the formula method, which minimizes the total ordering and carrying cost with no. of orders 9 times, which is also clear by the following tabular method.

Table 4.11

Trial and Error Approach of EOQ (Tabular Method) of 2062/63.

No. of orders	Order size (tones)	Average inventory(tones)	Total carrying cost(Rs)	Total ordering cost(Rs)	Total cost (Rs)
1	17362	8681	9748763	108472	9857235
5	3472	1736	1949752	542360	2492112
9	1929	964	1083196	976248	2059444
10	1736	868	974876	1084720	2059596
12	1447	723	812397	1301664	2114061

Graphic presentation of EOQ is as follows.

Figure No. 4.14

Graphic presentation of EOQ
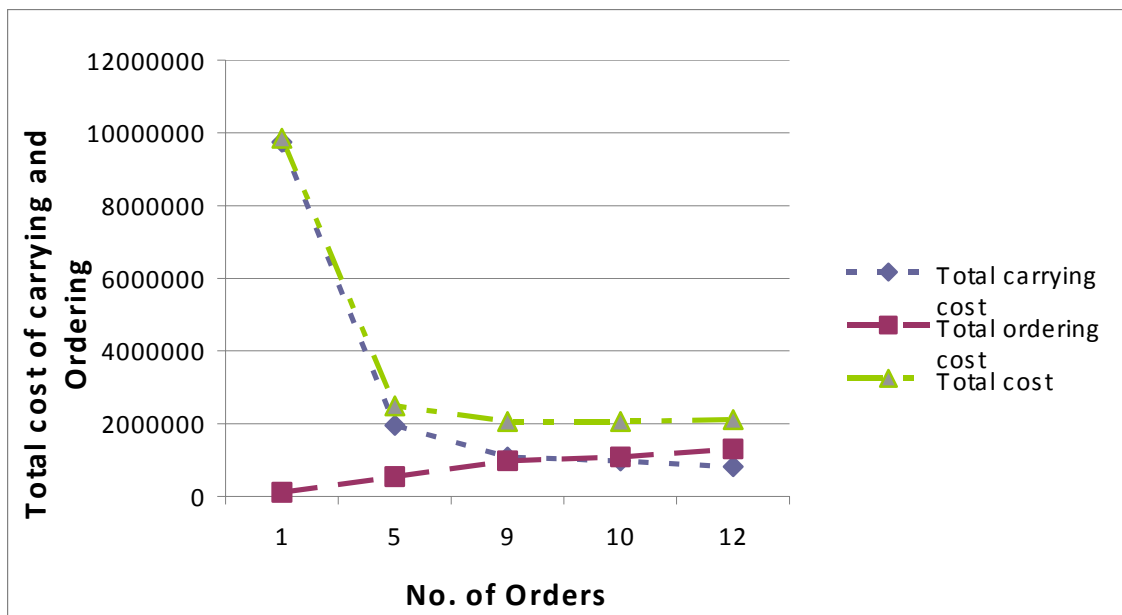
The above table and figure shows that the carrying cost is decreasing and ordering cost is increasing with the increasing number of orders. The above table shows the minimum total cost of raw materials is Rs. 2059444 where the total carrying cost is Rs. 1083196 and total ordering cost is Rs. 976248 with the number of order 9 times per year. So, it is clear that, if the company wants to minimize total cost of inventory of raw materials it should order 9 times during the year.

So, it becomes clear from formula, tabular as well as graphical method that the company should order 1831 tones with 9 times during the year.

4.6.4 Economic Order Quantity of RM on FY 2063/64.

Annual Requirement (A) = 21090 tones

Ordering cost per order (O) = Rs. 108492

Carrying cost per tones (C) = Rs. 1127 per tones.

By applying EOQ formula,

$$\text{EOQ} = \sqrt{\frac{2AO}{C}} \qquad \sqrt{\frac{2 \times 21090 \times 108492}{1127}} = 2014 \text{ tones}$$

(i) EOQ = 2014 tones.

(ii)   No. of orders $= \dfrac{Annual\ Requirement}{EOQ}$

$= \dfrac{21090}{2014}$

=10.47 times ≈ 10 times approx.

From the above calculation, the EOQ is 2014 tones under the formula method, which minimizes the total ordering and carrying cost with no. of orders 10 times, which is also clear by the following tabular method.

Table 4.12

Trial and Error Approach of EOQ (Tabular Method)

No. of orders	Order size (tones)	Average inventory (tones)	Total carrying cost (Rs.)	Total ordering cost (Rs.)	Total cost (Rs.)
1	21090	10545	11884215	108492	11992707
5	4218	2109	2376843	542460	2919303
9	2343	1171.5	1320281	976428	2296709
10	2109	1054.5	1188422	1084920	2273342
12	1758	879	990633	1301904	2292537

Source: Annual Reports of UNL.

Graphic presentation of EOQ is as follows.

Figure No. 4.15

Graphic presentation of EOQ
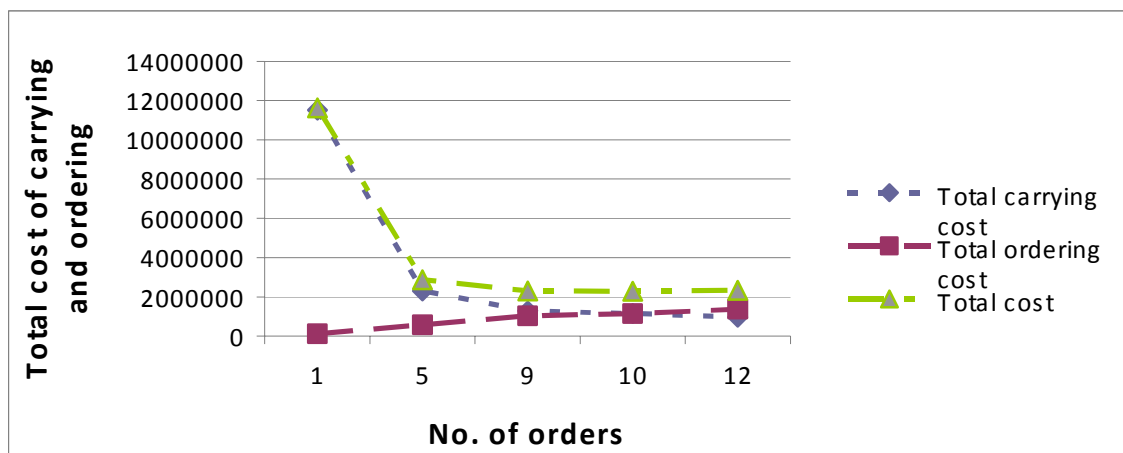
The above table and figure shows that the carrying cost is decreasing and ordering cost is increasing with the increasing number of orders. The above table shows the minimum total cost of raw material is Rs. 2273342 where the total carrying cost is Rs. 1188422 and total ordering cost is Rs. 1084920 with the number of order nearly 10 times per year. So, it is clear that, if the company wants to minimize total cost of inventory of raw material it should order 10 times during the year.

So, it becomes clear from formula, tabular as well as graphical method that the company should order 2014 tones with 10 times during the year.

4.6.5 Economic Order Quantity of RM on FY 2064/65.

Annual Requirement (A) = 19484 tones.

Ordering cost per order (O) = Rs. 113916

Carrying cost per tones (C) = Rs. 1183 tones.

By applying the EOQ formula,

$$\text{EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 19484 \times 113916}{1183}}$$

$$= 1937 \text{ tones}$$

(i) EOQ = 1937 tones.

(ii) No. of orders $= \dfrac{Annual\ Requirement}{EOQ}$

$= \dfrac{19484}{1937}$

$= 10.05 \approx 10$ times approx.

From the above calculation, the EOQ is 1937 tones under the formula method, which minimize the total ordering and carrying cost with the number of orders 10 times per year, which is also clear by the following tabular method.

**Table 4.13**

Trial and Error Approach of EOQ (Tabular Method) of 2064/65.

No. of order	Order size (tones)	Average inventory(tones)	Total carrying cost(Rs.)	Total ordering cost(Rs.)	Total cost(Rs.)
1	19484	9742	11524786	113916	11638702
5	3896.8	1948.4	2304957.2	569580	2874537.20
9	2164.68	1082.44	1280526.52	1025244	2305770.52
10	1948.4	974.2	1152478.60	1139160	2291638.60
12	1623.67	811.83	960394.89	1366992	2327386.89

Source: Annual Reports of UNL.

Graphic presentation of EOQ

Figure No. 4.16

Graphic presentation of EOQ
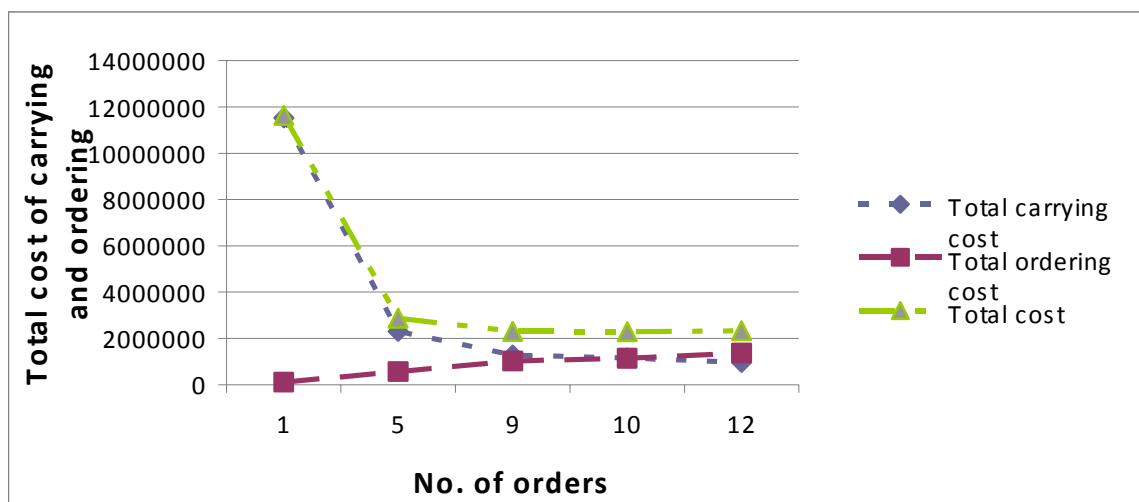
The above table and figure shows that the carrying cost is decreasing and ordering cost is increasing with the increasing number of order. The above table shows the minimum total cost of raw material is Rs. 2291638.60, where the total carrying cost is Rs. 1152478.60 and total ordering cost is Rs. 1139160 with the number of order 10 times per year. So, it is clear that, if the company wants to minimize total inventory cost of raw material it should order only 10 times during the year.

So, it becomes clear from formula, tabular as well as graphic method, that the company should order 1937 tones with 10 times during the year.

4.6.6 Economic Order Quantity of RM on FY 2065/66.

Annual Requirement (A) = 20929 tones

Carrying cost per tones (C) = Rs. 1228 per tones.

Ordering cost per order (O) =Rs. 118256.

By applying EOQ formula,

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 20929 \times 118256}{1228}} = 2008 \text{ tones}$$

(i) EOQ = 2008 tones.

(ii) No. of orders = $\dfrac{Annual\ Requirements}{EOQ}$

$$= \frac{20929}{2008}$$

= 10.42 ≈ 10 times approximately.

From the above calculation, the EOQ is 2008 tones under the formula method, which minimizes the total ordering and carrying cost with number of orders 10 times, which is also clear by the following tabular method.

Table 4.14

**Trial and Error Approach of EOQ (Tabular Method) of 2065/66.**

No. of orders	Order size (tones)	Average inventory(tones)	Total carrying cost (Rs.)	Total ordering cost (Rs.)	Total cost (Rs.)
1	20929	10464	12849792	118256	12968048
5	4186	2093	2570204	591280	3161484
9	2325	1162	1426936	1064304	2491240
10	2092	1046	1284488	1182560	2467048
12	1744	872	1070816	1419072	2489888

Source: Annual Report of UNL.

Graphic presentation of EOQ is as follows:

Figure No. 4.17

Graphic Presentation of EOQ.
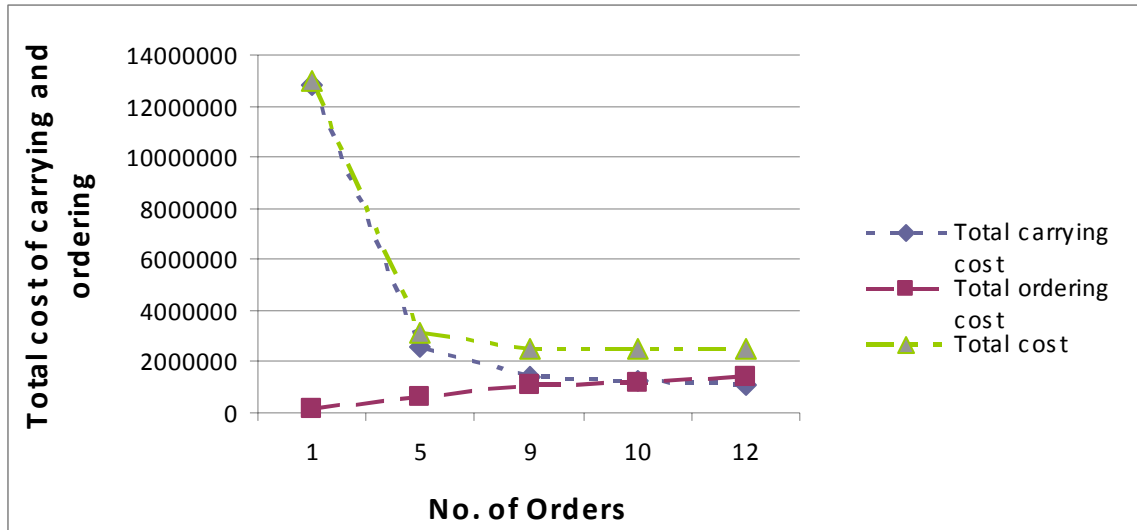
The above table and figure shows that the carrying cost is decreasing and ordering cost is increasing with the increasing number of order. The above table shows the minimum total cost of raw material is Rs. 2467048, where the total carrying cost is Rs. 1284488 and total ordering cost is Rs. 1182560 with the number of order is 10 times per year. So, it is clear that, if the company wants to minimize total cost of inventory of RM it should order only 10 times during the year.

So, it becomes clear from formula, tabular as well as graphical method, the company should order 2008 tones with 10 times during the year.

4.6.7 EOQ of Raw Materials (Chemicals and Perfumes) in Total Study Period.

Table 4.15

EOQ of Raw Materials in Total Study Period

Fiscal Year	EOQ in tones
2061/62	1675
2062/63	1831
2063/64	2014
2064/65	1937
2065/66	2008

Graphic presentation of EOQ of Raw Materials in Total Study Period

Figure No. 4.18
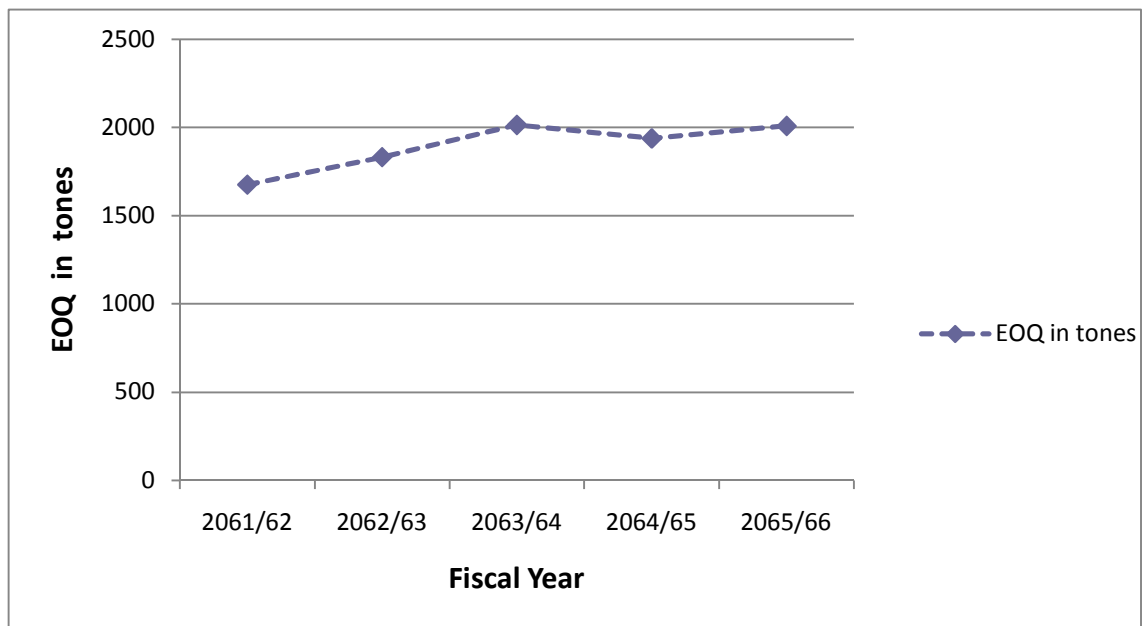
From the above table and figure, it can be interpreted that, there is no similar size of EOQ during the study period.

In the FY 2063/64, the EOQ of RM (Chemicals and Perfumes) is very high i.e. 2014 tones, while in the FY 2061/62 the EOQ of RM is very low i.e. 1675 tones. There is fluctuation in EOQ size during the study period due to various reasons. This type of fluctuation in ordering cost is due to fluctuation in demand.

4.6.8   Trend Line Analysis of Annual Demand of Raw Materials.

        Trend line analysis has been employed to the trend of purchase of raw materials. So, in this part attempt has been made to analyze the purchasing trend of raw material by using trend lines.

Table 4.16

Chemical and Perfumes

Fiscal Year	Annual Demand(tones)
2061/62	17665
2062/63	17362
2063/64	21090
2064/65	19484
2065/66	20929
Average	**19306**

Source: Annual Report of UNL.

Figure No. 4.19

Trend line analysis of Demand of Raw Materials
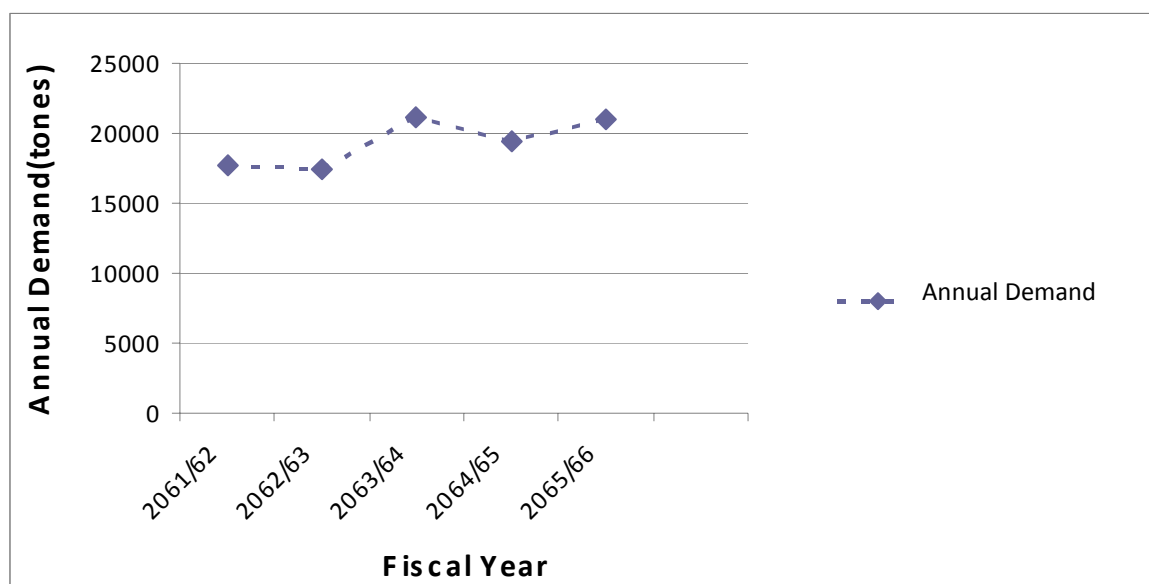
From the above table, it is observed that the average annual demand of raw material is 19306 tones. From the FY 2061/62 to 2062/63 the annual demand of raw material is below the average annual demand. Similarly, from the FY 2064/65 to 2065/66, the annual demand of raw materials is beyond the average annual demand. And after2062/63 annual demand of raw materials is increasing. From above table, it is observed that the company's production and selling transaction is fluctuating.

4.7   SELECTIVE INVENTORY CONTROL (ABC ANALYSIS)

As the term ABC implies "Always Better Control" which states that a fewer items of high investment value should be paid more attention than a bulk of items having low value and having a low investment in capital. Category A includes the most important items and recognized for special attention. Category B includes lesser important items and category C consists of the least important and low value items.

The classification of items into A, B and C categories is based upon the product value and usage rate. "A" item include 15% of items and 70% of total value of items. "B" item includes 30% of the items and 20% of total value of items. "C" item includes 55% of items and 10% of total inventory value.

According to ABC analysis concept, the item of inventory of Unilever Nepal Ltd. is categorized as A, B and C on the basis of product value and usage rate. The value items having more than rupees one lakhs per tones fall under category 'A'. The items having value from Rs. 50,000 to Rs. 100,000 per tone fall under category 'B' and the items having value to Rs. 50,000 per tones fall under category 'C'.

4.7.1   ABC Analysis Concept

According to ABC analysis concept, the items of inventory of UNL are categorized as A, B and C group on the basis of the usage value of shown in the table below.

Table 4.17

ABC Classification of Overall Study Period

Fiscal Year	2061/62		2062/63		2063/64		2064/65		2065/66		Average	
Proportion / Categories	% of total items	% of total cost	% of total items	% of total cost	% of total items	% of total cost	% of total items	% of total cost	% of total items	% of total cost	% of total items	% of total cost
'A' items oral care, skin creams hair care, food and beverages.	16.4	51	33.4	62.3	17.1	49.3	10	28	17	31	18.78	44.32
'B' items Toilet soaps.	15.4	24.7	29.7	25.6	31.1	33.7	53	53	53	54	36.44	38.2
'C' items Detergents, scourers, soap noodles, and laundry soap.	68.2	24.3	36.9	12.1	51.8	17	37	19	30	15	44.78	17.48
Total	100	100	100	100	100	100	100	100	100	100	100	100

Source: Unpublished Journal of UNL.

From the above table 4.17, it is observed oral care, skin creams, Hair care, food and beverages are categorized under 'A'. The table above shows that under 'A' category, average percentage of total units is 18.78% and average percentage of total cost is 44.32% during the study period. Therefore, 'A' group involves largest investment and would be under tightest control by management. It should rather keep a more rigorous control and the most sophisticated control techniques should be applied in 'A' items than another items.

Toilet soaps are categorized under 'B' items. The table 4.21 above shows that under 'B' items, average percentage of total units is 36.44% and average percentage of total cost is 38.2% of the overall study period. Therefore, in 'B' group involve normal inventory control is exercised. The 'B' group stands mid way. It deserves less attention than 'A' but more than 'C'. It can be controlled by employing less sophisticated techniques.

Detergents, scourers, soap noodles, laundry soaps are categorized under 'C' items. The table above shows that under 'C' items, average percentage of total units is 44.78% and average percentage of total cost is 17.48% of the overall study period. In case of 'C' items, simple control will be sufficient.

The categories reflect the concept that it is uneconomical to spend the same cost of supervision to all items. Inventories are checked physically once every six months or every year to determine new order to place. Based on these considerations the selective inventory control system of the company is analyzed. In the above table 4.21,it is clearly seen that percentage of total cost of 'B' items is comparatively high but per tone cost is less than 'A' and more than 'C'. In order to minimize the inventory cost, 'A' items should be paid more attention than 'C'.'B' lies in between items 'A' and 'C'. It requires neither careful nor simple but a moderate control system is adequate for this item.

4.8   ANALYSIS OF PRIMARY DATA

The primary data gives the accurate information of the company. The data are collected through direct personal interview by preparing written questionnaire with company secretary of UNL. The questionnaires are shown in Annex 'D'.

As the question is asked to the responsible person of UNL, it is found that the inventory management and control system followed by UNL are ABC analysis and physical checking system. The question is asked to reveal the ranking of cost for solution of ABC analysis the company could give only the name of inventories but not specified the cost. The researcher found that RM, WIP and stores and spare parts are controlled through physical checking system and finished goods are controlled through ABC analysis.

Responding to the question asked about the cost of ordering and carrying, the researcher found that there is no systematic and scientific system to determine ordering and carrying

cost. In the answer asked about the purchasing system it is found that procedures are followed by UNL are centralized purchasing procedure and RM and WIP materials are purchased from HLL of India.

As the question asked to UNL about store control technique used by the company with the option of bin cards and store ledger, the researcher found that the company is using bin card technique to control the store and the valuation of inventories with various options, the researcher found that the pricing of issues can be determined by value as per weighted average cost method.

Regarding the question about the problem faced by the UNL in managing the inventories, the researcher found the following major problems faced by the company while operating and managing the inventories. Political crisis and especially Nepal Bandh, strikes and lockout organized by different pressure groups directly affect the company and its inventory management while geographical barriers and transportation problems are other problems faced by UNL.

4.9   MAJOR FINDINGS

Major findings from the analysis of primary and secondary data are explained in following points.

i)   Inventory management and controlled system followed by manufacturing companies are ABC analysis, perpetual inventory management system (physical checking), EOQ etc.

ii)   In the company, there are different types of inventories, like RM, WIP, finished goods and stores and spare parts. Purchasing is the first step of inventory management of manufacturing companies. When all items of inventories are received by purchasing department they are passed into the store. So, these items are handled and managed carefully.

iii)   There are various problems like political crisis, strikes lockout and transportation problem facing by the manufacturing companies regarding the management of inventories.

iv)   The company has not been adopting appropriate inventory policy because inventory constitutes the higher proportion than that of other items of current assets. The company has not followed any type of inventory policies.

v)   The fluctuation in stock of RM during the study period is very high. Defective purchasing policy and poor planning of raw materials are the main responsible factors for such fluctuation. There is no fixed policy of purchasing materials.

vi)   Demand and sales of company (UNL) are very fluctuating. The main reason of such fluctuation is lack of appropriate inventory policy and ineffective demand forecast.

vii)   The correlation between sales and net profit is 0.7861.Therefore, there is significant relationship between sales and net profit and it is concluded that the change in sales results change in net profit.

viii)   The correlation between inventory and net profit is 0.9337, so it becomes clear that there is positive and high degree of correlation between inventory and net profit. 'T' statistics also indicate that correlation coefficient between inventory and net profit is significant.

ix)   EOQ is not similar during the study period. This type of fluctuation is due to variation of ordering cost and fluctuation in demand but the company has not used EOQ model to manage and control of the inventory.

x)   UNL is using bin card technique and ABC analysis to control and manage the store in order to minimize the cost of holding materials. The bin-cards are maintained by storekeeper.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1   Summary

Inventory management is one of the most important functions in any organization. Without effective and efficient inventory management no organization can achieve its goal. Success of any enterprises basically depends on the efficiency and effectiveness of systematic management. Inventory management is the most important part for manufacturing company. The company has invested the most amounts for inventory, where the functions are associated as purchasing, storing, selling, distribution etc.

Inventory management is the most important part for manufacturing company. A firm cannot achieve its goal unless inventories are controlled effectively and capital is allocated efficiently. Inventory functions are associated with production, marketing, finance and administration etc. Inventory constitutes most significant part of current assets. It should therefore be managed efficiently to avoid unnecessary investment. Unilever Nepal Limited is a subsidiary company of Hindustan Lever Limited. UNL produces different types of products and product groups. So, this study deals with inventory management of Unilever Nepal Limited.

The basic problem area of this study is to examine the inventory management system practiced by the company is unscientific. The carrying cost, ordering cost, order size safety stock maintained is unsatisfactory and unscientific. It is not paying much attention to the lead-time. Therefore, all these functions lead to increase total cost of the company.

The main objective of this study is identifying the inventory management system of Unilever Nepal Ltd. In this study an attempt has been made to identify the inventory position of UNL, to know the relationship between sales and inventories with identifying their trends, to assess the inventories and their consequences on profitability of UNL and suggest over the better practice of inventory management of UNL.

This study is one of the new studies, which only tries to know the inventory management of UNL.

The required information is secondary as well as primary. The researcher had submitted question to UNL to find out actual result and the researcher collected the secondary data from annual report of UNL.

All the collected data are analyzed on the basis of inventory management with the help of ABC analysis, EOQ model, inventory turnover ratio, RM turnover ratio, correlation coefficient, average percentage of the total study period by presenting with table and figure in required places. The analysis has been done year wise as well as the average of total study period is analyzed. To make certain type of inventory management decision many statistical tools, financial tools and technique are available for controlling the inventory but the company has not applied some sort of technique for managing the inventory.

5.2   CONCLUSIONS

The inventory management of UNL is not only necessary but also compulsion for better performance of the organization. If UNL initiates step to the appropriate management of inventory, certainly it will cope its set objectives successfully. This study is just a small part to fulfill the partial requirement of MBS. Concerning these findings it may be appropriate to make some suggestion and recommendations. Although these suggestions may not be enough they certainly suggest the areas that can be improved and require attention to bring some improvement in inventory of UNL.

The major finding of the study as revealed from the analysis can be stated as follows:

➤ UNL is the subsidiary company of Hindustan Lever Limited with holds 80% share of UNL is used to take the centralized purchasing procedure. Therefore, required raw material (chemicals and perfumes) and WIP material (soap noodles) are imported from HLL of India.

➤ UNL uses the bin card technique to control the store in order to minimize the cost of holding materials. The bin-cards are maintained by store-keeper.

➤ The pricing of the issues can be determined by value as weighted average cost method at the lower cost or market price.

- Inventory constitutes the higher proportion than that of other items of current assets. The average percentage of inventory on current assets is 28.11%.The highest proportion of investment on inventory in the FY 2061/62,i.e.36.19% and the lowest proportion of investment on inventory in the FY 2062/63,i.e.21.37%.This results shows that the company has not been adopting appropriate inventory policy.

- In UNL, inventory includes raw materials, packaging materials, WIP materials, finished goods and stores and spare parts. The average percentage of RM in total inventory in the overall study period is 46.35%. The highest proportion and RM on total inventory is 54.19% in the FY 2064/65, and lowest proportion of RM on total inventory is 36.20 percent in the FY 2065/66.Therefore, it is observed that raw material consumption in the company is elastic. The fluctuation in stock of RM during the study period is very high. Defective purchasing policy and poor planning of raw materials may be responsible factors for such fluctuation.

- The average percentage of packaging material in the total inventory is 11.71%.The highest proportion of packaging material on total inventory is 14.70% in the FY 2061/62.The lowest proportion of packaging material on total inventory is 9% in the FY 2062/63.The share of packaging materials in the company is elastic. This results shoes that there is no fixed policy of purchasing packaging material. It is because that the company might have forecasted higher level of sales volume by looking at the gradually increasing trend of sales in previous year.

- The average percentage of WIP materials in total inventory is 2.87%, which is low in comparison with other inventories. The highest proportion of WIP on total inventory is 4.4 percent in the FY 2061/62.The lowest proportion of WIP on total inventory is 1.52 percent in the FY 2064/65.The WIP materials consumptions in the company is fluctuating during the study period. Fluctuation in demand and sales of company products, lack of appropriate inventory policy and ineffective demand forecast are the main reasons of such fluctuation.

➢ The average percentage of finished goods in total inventory is 35.24%.The highest value of finished product, i.e Rs. 45.42 million is produced in the FY 2065/66 as compared with the overall study period. Fluctuation of demand and sales of the company are the main reason for such situations.

➢ The average percentage of stores and spare parts in total inventory is 3.83%.During this period, the quantity of stores and spare parts used by the company is irregular during the study period. Since, the company's production is totally dependent on stores and spare parts, it obviously fluctuates over the study period.

➢ The average value of sales is Rs.1392.13 million and average value of net profit is Rs. 140.79 million. The highest positive deviation from the average sales is 9.53 percent in the FY 2063/64 and the highest positive deviation from the average net profit is 69.16 percent in the FY 2065/66.The highest negative deviation from the average sales is (11.18) percent in the FY 2061/62 and the highest negative deviation from the average net profit is (69.74) percent in the FY 2061/62.The correlation between sales and net profit is 0.7861. Therefore, there is significant relationship between sales and net profit and it is concluded that the change in sales results change of net profit.

➢ The average value of inventory is Rs. 188.14 million and average value of net profit is Rs. 140.79 million. The highest positive deviation from an average net profit is 69.16 percent in the FY 2065/66.Similarly,the highest negative deviation from an average net profit is (69.74) percent in the FY 2061/62.The fluctuating inventory and net profit indicates that there is no specific policy of investment on inventory. However, the level of inventory has been maintained according to the demand of products.

The correlation inventory and net profit is 0.9337.So, it becomes clear that there is positive and high degree of correlation between inventory and net profit.

➢ Inventory turnover ratio shows the relation between sales and inventory and it also shows the efficiency of inventory management. The average ITR is 7.78 times and

found to be satisfactory. The highest ITR is 9.87 times in the FY 2062/63.So, in this year, low inventory is kept in the company and due to fast movement of the materials and finished goods.

The correlation between inventory and sales is0.7954.Therefore, there is significant relationship between inventory and sales and it is observed that changes in inventory results changes into the sales.

➢ EOQ is not similar during the study period. In the FY 2063/64 the EOQ of RM is very high i.e.2014 tones, while in the FY 2061/62 the EOQ of RM is low i.e.1675 tones. This type of fluctuation is due to variation of ordering cost and fluctuation in demand.

➢ The annual demand of RM is fluctuating. An average annual demand of RM is 19306 tones. From the FY 2061/62 to 2062/63 the annual demand of RM is below the average annual demand. In these years, the company's production and selling transaction are increasing.

➢ The significance of the ABC analysis reflects the concept of appropriate management of inventory. The concept states that it is uneconomical to spend the same cost of supervision to all items. It is clearly seen that under 'A' items, an average percentage of total units is 18.78 percent and an average percentage of total cost is 44.32.Similarly,under 'B' items an average percentage of total units is 36.44 and the average percentage of total cost is 38.20.Again,under 'C' items, the average percentage of total units is 44.78 and the average percentage of total cost is 17.48.So,it is clearly seen that the average percentage of total cost of 'B' items is comparatively high but per tone cost is less than 'A' items and more than 'C'. In order to minimize inventory cost of 'A' item should be controlled carefully and should be paid more attention than 'B' and 'C'. 'B' item lies in between 'A' and 'C' item. It requires neither careful nor simple but a moderate control system is adequate for this item.

➢ The company has faced some problems on managing proper inventories in using pull system because there is uncertainty about the future supply of materials, operation of factory, Nepal bands, lockouts, strikes, geographical problems, fluctuation of material prices etc.

5.3 RECOMMENDATIONS

To achieve all the objectives of UNL, the efficient management is essential. The management of inventory in UNL is not only necessary but compulsory for the better performance of the company. If UNL initiates steps to the appropriate management of inventory, certainly it will attain its set objectives successfully. On the basis of the study, the following suggestions may be recommended for consideration.

i) The company should define its objectives clearly with regarding to its inputs and outputs separately. Quantities and time period should be specified.

ii) Purchasing plan should be prepared for different types of raw materials and WIP materials with the proper co-operation and coordination among the planning, purchasing, storing, production, marketing and sales department to avoid excessive investment on inventory.

iii) In UNL, inventory constitutes the highest proportion among the current assets. So UNL should give great attention to the inventory management. The company should adjust the inventory according to the sales and production on its priority basis. Holding large amount of inventory requires high operating cost. There should be good storekeeping system, better material handling system and timely inspection. Moreover, systematic inventory control system should be applied to know the inventory position in the company.

iv) UNL has not been able to satisfy the level of customers demand. Company should try to use optimal capacity which has been idle now to maintain the level of customer demand. By this way the company's profitability will be increased.

v)   It is found that the company has not used EOQ model for optimum level of inventory management system. It is recommended that the order size of inventory which minimizes the total cost of inventory, i.e. ordering and carrying cost should be applied. So, that company should adopt inventory management technique.

vi) In order to minimize inventory cost, 'A' item should be controlled carefully and should be paid more attention than 'B' and 'C' items. It requires neither careful nor simple but a moderate control system is adequate for this item.

vii) UNL is a multinational company and its products are competing in the international market. So, company can use either a push or a pull inventory model. Push inventory models deal with scheduling orders for production in advance of customer demand. It refers MRP I, MRP II and DRP etc. On the other hand pull model are based on making goods once customer demand is known. The products are pulled through the channel of distribution by the order. Recent trends suggest a movement to use pull inventory models to reduce inventory through out the channel. Pull inventory models deals with Just-in-time and Kan-Ban inventory models. Thus, the UNL should try to adopt pull inventory models.

viii) Planning of inventory is most welcomed in the world today. So products of different types of personal products, oral care, different groups of soaps, detergents etc should be produced on planned basis and attention should given to implement better marketing strategies to take a strategic advantage of competitive world.

ix) Specific policy on inventory should be defined and comprehensive system of inventory management has to be introduced.

x)   Inventory should not treat as a reason for investment rather it should be planed as coordinating factor between sales and production.

xi) Primary problem faced by UNL in production planning are unsuitable inventory and production policy, lack of coordination between sales and production. So the company should clarify production and inventory policy.

xii)   It can't reduce production without adjusting in sales and inventory. If there is limitation on factor of production, sales has to be adjusted in order to maintain coordination between sales, production and inventory.

xiii)   To avoid the problem of overstocking, UNL should consider on following points,

- Target sales should be realistic.

- Target should be within the capacity of being fulfilled.

- Demand should be forecasted with appropriate techniques.

xiv)   For timely procurement and supply of raw materials, UNL should not depend upon unreliable sources. It is better to procure raw material by inviting tender because this system is more reliable and economic.

xv)   UNL should attempt to use scientific inventory model. UNL should use EOQ model to determine order size, which minimize cost of organization and increase the profitability.

xvi)   The organization should define its objectives clearly with regard to its inputs and outputs separately.

xvii)   Minimum, Maximum and reordering level for each types of material should be fixed by the company to avoid the overstocking of different types of materials.

The top level management should pay its attention to the overall management, purchasing, production and financial aspect of factory.

Calculation of Correlation between Sales and Net profit

(Rs. in million)

Fiscal Year	Sales in Rs. (X)	Net profit in Rs.(Y)	X²	Y²	XY
2061/62	1236.45	42.6	1528808.60	1814.76	52672.77
2062/63	1244.73	93.6	1549352.77	8686.24	116008.84
2063/64	1524.90	140.78	2325320.01	19819.01	214675.42
2064/65	1484.89	189.19	2204898.31	35792.86	280926.33
2065/66	1469.69	238.16	2159988.70	56720.18	350021.37
Total	**Σx=6960.66**	**Σy=704.338**	**Σx²=9768368.39**	**Σy²=122833.05**	**Σxy=1014304.73**

Source: Annual Report of UNL.

Correlation between Sales (X) and Net profit (Y)

$$r = \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - \left(\sum x\right)^2}\sqrt{N\sum y^2 - \left(\sum y\right)^2}}$$

$$r = \frac{5 \times 1014304.73 - 6960.66 \times 704.33}{\sqrt{5 \times 9768368.39 - \left(6960.66\right)^2}\sqrt{5 \times 122833.05 - \left(704.33\right)^2}}$$

r = 0.7861

$\therefore$ Correlation (r) =0.7861

Calculation of correlation between Inventory and Net profit

(Rs. in million)

Fiscal year	Inventory in Rs. (X)	Net profit in Rs. (Y)	X²	Y²	XY
2061/62	144.46	42.6	20868.69	1814.76	6153.99
2062/63	126.11	93.6	15903.73	8686.24	11753.45
2063/64	184.22	140.78	33937.00	19819.01	25934.49
2064/65	229.76	189.19	52789.66	35792.86	43468.29
2065/66	256.17	238.16	65623.07	56720.18	61009.45
Total	**Σx=940.72**	**Σy=704.33**	**Σx²=189122.15**	**Σy²=122833.05**	**Σxy=148319.67**

Source: Annual Report of UNL.

Correlation between Inventory (X) and Net Profit (Y)

$$r = \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - \left(\sum x\right)^2}\sqrt{N\sum y^2 - \left(\sum y\right)^2}}$$

$$r = \frac{5 \times 148319.67 - 940.72 \times 704.33}{\sqrt{5 \times 189122.15 - \left(940.72\right)^2}\ \sqrt{5 \times 122833.05 - \left(704.33\right)^2}}$$

r =0.9337

∴ Correlation (r) =0.9337

Annex 'C'

Calculation of Correlation between Inventory and Sales

(Rs. in million)

Fiscal year	Sales in Rs.(X)	Inventory in Rs. (Y)	X²	Y²	XY
2061/62	1236.45	144.46	1528808.60	20868.69	178559.78
2062/63	1244.73	126.11	1549352.77	15903.73	156972.90
2063/64	1524.90	184.22	2325320.01	33937.00	280917.08
2064/65	1484.89	229.76	2204898.31	52789.66	341168.33
2065/66	1469.69	256.17	2159988.70	65623.07	376490.49
Total	**Σx=6960.66**	**Σy=940.72**	**Σx²=9768368.39**	**Σy²=189122.15**	**Σxy=1334108.58**

Source: Annual Report of UNL.

Correlation between Sales (X) and Inventory (Y)

$$r = \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - \left(\sum x\right)^2}\sqrt{N\sum y^2 - \left(\sum y\right)^2}}$$

$$r = \frac{5\times 1334108.58 - 6960.66\times 940.72}{\sqrt{5\times 9768368.39 - \left(6960.66\right)^2}\sqrt{5\times 189122.15 - \left(940.72\right)^2}}$$

r = 0.7954

∴ Correlation (r) = 0.7954

Annex 'D'

Questionnaires of Unilever Nepal Limited for the purpose of the study on Inventory Management.

1. The inventory management and control system followed by Unilever Nepal Limited are
    A. Inventory management through ABC analysis   [√]
    B. Perpetual inventory management system(physical checking)   [√]
    C. Determination of optimal stock level(EOQ)   [ ]
    D. If other, please specify   [ ]
2. In application of ABC analysis, specify the name of inventories (raw materials, work-in-progress, finished goods and spare parts) according to the purchasing cost, manufacturing cost and selling price.

(High cost to low cost)

S.N.	Raw Materials	Work-in-progress	Finished Goods	Spare Parts
1	Distilled fatty acid	Soap noodles	Detergents	
2	Luric acid	Soap noodles	Toilet soaps	
3	Caustic soda		Personal soaps	
4	Soda ash		Scourers	
5	Sorbital		Laundry Soap	

3. What are the purchasing procedures of Unilever Nepal Limited?
    A. Centralized purchasing   [√]
    B. Decentralized purchasing   [ ]
4. The store control technique used by the Unilever Nepal Limited?
    A. Bin card   [√]
    B. Store ledger   [ ]
5. What are the methods used by Unilever Nepal Limited for valuation of inventories?
    A. Weighted average cost method   [√]
    B. First in first out method (FIFO)   [ ]
    C. Last in first out method (LIFO)   [ ]
    D. Special identification method   [ ]
    E. Average cost method   [ ]
    F. Latest purchase price   [ ]
    G. Highest in first out method (HIFO)   [ ]
    H. Retail inventory method (Adjusted selling price)   [ ]
6. Please, specify the problem faced by the Unilever Nepal Limited Company while managing the inventories?
    ➢ Nepal Banda strikes, Lockout
    ➢ Unexpected change in price
    ➢ Geographical problem

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