

CHAPTER – III

RESEARCH DESIGN AND METHODOLOGY

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3.1 Introduction:

The materials form a very significant proportion of total cost in most of the industries. So, if any industry intends to economise the cost of production, it can achieve this objective by economising the use of materials and by exercising a materials control system. This material-control covers the efficient functioning of various operations such as purchase of materials, receiving of materials, inspection, storage, issue and usage as well as maintenance of stores records. Having achieved this objective, the organization is in a position to eliminate the waste in the use of materials, the risk of loss as well as reduction in working capital requirements.

3.2 Objectives:

The study has been undertaken with the following objectives:

- (1) To study the purchase policies,
- (2) To study the recording of receipt of materials,
- (3) To study the method of storing the inventories,
- (4) To study the method of issuing inventory to workers,

- (5) To study the various techniques adopted for controlling the inventories,
- (6) To suggest remedial measures.

3.3 Statement of the Problem:

Taking into consideration the importance of inventory management, the problem of "A Study of Inventory Management in Selected Industrial Units in Miraj M.I.D.C." has been undertaken.

3.4 Methodology Adopted:

For the present study undertaken, the survey method and the observation method have been adopted.

In the **survey method**, visits were paid to a number of industrial units, keeping in view those organizations which had the scope for the usage of various materials.

To have a better insight into the study, **observation** was also made to note the method of storing of the inventories, the general layout of stores as well as the receipt and issue of the materials.

(a) Sources of Data:

The data has been collected through major sources, i.e. the primary source and the secondary source.

Before the survey was undertaken, a comprehensive questionnaire was developed by considering the various aspects of inventory management. To pre-test this questionnaire, a pilot study was undertaken. After the pilot study, the questionnaire was finalized and the survey was undertaken by personally administering the final questionnaire.

Similarly, to reinforce the data collected through the questionnaire, interviews were also conducted. Interviews of the purchase officers, storekeepers and supervisors were undertaken to cross-examine the information collected through the questionnaire. The interviews were informal and unstructured in nature.

The secondary data comprises office record and published literature. During the survey, simultaneously, the information relating to the inventory management was collected from the office records of various organizations.

In some of the organizations, having annual reports and their published literature were also collected for the conceptual background and for the literature of past studies, various libraries were visited and the information was collected from textbooks, reference books and a number of magazines and journals. The following libraries were visited:

- (1) Library of Chh.Shahu Central Institute of Business Education & Research, Kolhapur;

- (2) Barr.Khardekar Library, Shivaji University, Kolhapur;
- (3) V.P.I., M.S.R., Sangli;
- (4) Library of A.C.S.College, Tasgaon.

(b) Sample Design:

The present sample of the study constitutes sixteen industrial units in Miraj M.I.D.C. The sampling technique adopted was purposive sampling; the reason being only those organizations were considered where only the scope for inventory management existed.

3.5 Survey of Past Studies:

The author Parth Sarthi,¹ in his article "Performance Indicators in Materials Management", has highlighted some indicators of performance in materials management. In his opinion, inventory levels, inventory turnover ratio, material holdups, work-in-progress, inventory-in-transit, are most commonly used indicators of the art of materials management. In this discussion, he also emphasized some indicators for stores management, such as time-lag analysis, handling cost, number of bills handled, discrepancies found in stock verification, pending rejected items and outstanding claims of insurance.

Finally, the author concludes by stating that, *'Performance indicators', itself, is not a means of improving productivity and a high rating by one*

indicator does not necessarily indicate high efficiency.

The author K.Gopal,² in his article, has highlighted certain key issues regarding the inventory management. In his opinion, the importance of inventory management is to ensure adequate stocks of raw materials, stores and finished goods. He also feels that lower inventory of raw materials could result in production stoppage, and having discussed the importance of need for inventory management, the quantity of inventory to be maintained and aids to inventory management, emphasis is laid on the various inventory management techniques, such as maximum and minimum levels, economic order quantity, fixing the re-order level and ABC analysis.

In this article, the author A.Varadarajan,³ has attempted to identify forecasting systems and the criteria in choosing techniques. The author has also explained the importance of measuring forecasting errors and using them in determining the inventory levels. He has classified forecasting systems into to 'qualitative' and 'quantitative' categories; and has suggested the following forecasting techniques:

- (1) The accuracy desired,
- (2) The pattern of data used,
- (3) The time horizon,
- (4) The cost,
- (5) The ease of application.

He also states that forecast helps to reduce inventory investment and maintain the desired service levels.

The uncontrolled inventory is the graveyard of industry and, therefore, the author B.H.Suresh⁴ explains the brief decision-making in material management for improving profit. According to him, material cost seems to be the most potential area for cost minimization and profit maximization. He has discussed eight contributing factors, which help in improving the profit:

- (1) Cost factor,
- (2) Investment factor,
- (3) Leverage effect,
- (4) Frequency of decision-making,
- (5) Flexibility,
- (6) Easy handling,
- (7) Choice factor,
- (8) Focal point of decision-making.

He has also explained four areas where more control is required to be exercised:

- (1) Material specification,
- (2) Procurement,
- (3) Storage and usage,
- (4) Quality control.

Finally, he has concluded that it is the control over material cost, which makes organization stand competitive

and to be on top in the world of business and gives life to the organization forever.

In the article, "Wastage in Manufacturing Undertakings", Y.Sharma,⁵ has highlighted common sources and their treatment in cost. He has mentioned three sources of wastage, viz. (i) store-keeping losses, (ii) loss during processing, (iii) loss in labour and overheads. According to his studies, treatment in cost for the abovementioned losses is as follows:

- (a) Normal waste costs should be charged to costing in profit and loss account;
- (b) Invisible wastes (i.e. evaporation, shrinkage, etc.) is commonly built into the bill of materials in the form of allowances;
- (c) Loss in storekeeping is charged to costing in profit and loss account.

Finally, he concludes that the practical approach is to keep this revenue separate from costs unless the revenue is sizeable and can influence decision-making.

V.Rengaswami,⁶ in his article "Stock Control, How?", has discussed how to fix appropriate stock levels and stock control techniques. He has discussed four techniques for stock control:

- (1) ABC analysis,
- (2) Fast and non-moving items analysis,
- (3) Combining turnover ratio with ABC analysis,

(4) Review and order period.

Finally, he concludes that periodic meetings of the heads of production, purchase, stores and finance, would foster a better flow of information and feedback, that is required for maintaining the efficiency of the stock control system. Such face-to-face communication can also help appreciate one another's difficulties, efforts and contributions.

In the article, "MBO - A Programme of Cost Reduction", K.Shivakumar,⁷ has attempted the programme of M.B.O with cost reduction plan. He has discussed the introduction of M.B.O. with a programme of cost reduction in three steps:

- (1) inviting proposals for cost reduction programme from the people concerned;
- (2) after the proposal is accepted, it should be given a fair chance of its implementation;
- (3) it is essential to involve all the people concerned to make the programme successful and also review frequently and regularly.

The author, Ramana Rao,⁸ in his article, has highlighted the aspects of materials management. According to his study, the aspects of materials management can be grouped under three important systems of control, viz. (1) inventory control, (2) ABC analysis, and (3) value analysis.

His study highlights the management of materials and covers a wide complex of activities relating to materials, viz. source-development, buying, transport, storage, handling, usage, scrap and its control and wastage, etc.

Finally, he points out that the material component from a substantial portion of the total unit cost and any savings in the cost of materials enhance the profitability of the organization on a long term and permanent basis.

D.K. Tejwani,⁹ in his article, has discussed in detail how computerized inventory control system is maintained. According to him, in computerized inventory control system, a kardex system is operated for each store. There is a stock verification team which selectively verifies stock through the year and their report is sent to the headquarters computer centre where these are processed. The principal file for the computerized inventory control system is a material master file for each material item in the stores, a detailed master record is kept in the master file.

The author has explained the procedure of processing when a new material item arrives in the following steps:

- (1) Master maintenance,
- (2) Transaction validation,
- (3) Master updation.

During processing, several error conditions which are properly signalled may come up. These are then looked into and corrected in the next run. The errors are of two types, viz. fatal errors and warning errors. For 'error correction', he has suggested that all transactions with errors should be extracted. Wrong ones for which transactions have been supplied are deleted and the remaining transactions are merged into current month's transactions and processed.

J.L.Gupta,¹⁰ has discussed two problems with regard to overhead as an element of inventory cost. The first is the problem of cost selection and the second is different ways of assigning overheads to closing inventories.

Firstly, in cost selection, it is necessary to decide what items of overheads are to be associated with the cost of goods sold and the cost of goods not sold; and secondly, in cost assignment, he has focussed on the issue as to which fixed overheads are to be associated with the inventory cost. The next task is to determine the appropriate way of relating these overheads to closing inventories.

M.Selvam,¹¹ has highlighted some of the important quantitative techniques of inventory management. According to him, the quantum of inventory carried depends on the following motives of the organization:

- (1) Transaction motives,
- (2) Precautionary motives,

(3) Speculative motives.

In this discussion, he feels that inventory management is relatively a simple affair when there is certainty as to the usage, lead-time, etc. But it is too much to expect in the practical problem. However, the management can do well even under conditions of uncertainty if it cares to do some planning in this area. Finally, he concludes that given the relatively stable market conditions, quantitative techniques can be of great help in efficient inventory management.

3.6 Scope of the Study:

The study has been confined to the inventory management only, without going into the costing aspects of inventories in which the purchasing, receipt and inspection, storing and issuing and record keeping are emphasized. At the same time, the study is restricted to Miraj M.I.D.C.; so, the findings and the suggestions made would be applicable and limited, more or less, to these organizations only.

3.7 Significance of the Study:

The term 'material' refers to all the commodities consumed in the process of manufacture. It is often used synonymously with the stores, which have, however, a wider meaning and scope.

The material being the biggest cost factor, it has a wide scope for savings in costs. Therefore, a costing system has to provide for a proper control over materials. Material control is a systematic control over purchasing, storing and consumption of materials, so as to maintain a regular and timely supply of material; at the same time, avoiding overstocking and shortages. It can be achieved by systematically organizing and standardizing the procedures and activities relating to purchasing, receipt and inspection, storing, issuing and record-keeping.

3.8 Chapter Scheme:

The Dissertation has been divided into Five Chapter. **First Chapter** deals with the framework aspects as introduction, purchasing, receipt and its inspection, storage, issue to production, recording and material control, etc. **Second Chapter** is devoted to the profile of Miraj Taluka, the study area. **Third Chapter** describes research design and includes introduction to the inventory management, objectives of the study, statement of the problem, methodology adopted, sources of data, survey of past literature, scope and significance of the study and sample size. **Fourth Chapter** presents, analyses and interpretes the data collected through the questionnaire administered to the sample respondents. **Fifth Chapter** records the conclusions drawn from the analysis and interpretation of the data presented and also renders

certain suggestions for the possible improvements in the inventory management of the organizations covered under study. The questionnaire used for collecting the data comprises the **Appendix** and a comprehensive **Bibliography** concludes the Dissertation.

REFERENCES

1. Parth Sarthi, "Performance Indicators in Materials Management", Udyog Pragati, Vol.VI, July-December 1982, p.22.
2. K.Gopal, "Inventory Management", The Management Accountant, December 1989, p.771.
3. A.Varadrajan, "Forecasting in Inventory Control", The Management Accountant, December 1983, p.538.
4. B.H.Suresh, "Material - A Potential Area for Improving Profits", The Management Accountant, July 1987, p.499.
5. Yogendra Sharma, "Wastage in Manufacturing Undertakings", The Management Accountant, July 1987, p.499.
6. V.Rengaswami, "Stock Control, How?", The Management Accountant, February 1989, p.95.
7. K.Shivakumar, "MBO, A Programme of Cost Reduction", The Management Accountant, February 1989, p.97.
8. A.V.Ramana Rao, "Controlling Cost - Costing Techniques", The Management Accountant, November 1987, p.786.

9. D.K.Tejwani, "Computerized Inventory Control System", The Chartered Accountant, January 1985, p.538.
10. J.L.Gupta, "Overhead as an Element of Cost", The Chartered Accountant, March 1986, p.726.
11. M.Selvam, "Quantitative Techniques", The Financial Express, (Daily) (Bombay), 10.5.1990.

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