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# **CHAPTER - I**

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**SCOPE, OBJECTIVES, METHODOLOGY AND LIMITATIONS.**

## SCOPE, OBJECTIVE, METHODOLOGY & LIMITATIONS

### SCOPE:-

In simple terms inventory means stock of commodity to meet future demand. Inventory refers to raw materials, work-in-progress, finished goods, store and spares. Inventories in general are built-up to provide a cushion against supply and demand. They are meant to take care of requirement of demand till the next arrival, probable delay in delivery and sudden increase in demand.

The two basic issues one must consider while dealing with inventories are

- i]. When to order and
- ii]. How much to order.

A set of decision rules which specifies when to order and how much to order is called an inventory policy. Inventory control involves deciding the no. of items to be stocked to meet the uncertain future demand and supply so that the relevant cost per unit time is minimum.

The importance of inventory management can be summarised as follows.

1. It helps in Coupling various production stages so that down time in one stage does not affect the entire production process.

It helps to continue the production process.

2. It helps in continued production by ensuring that replenishment of raw material is always available and economic production run can be made.

3. It provides a means to guard against

    i]. Variation in demand.

    ii]. Price rise in future.

    iii]. Uncertainties in delivery of raw material due to strike, inflation etc.

    iv]. It provides a means of obtaining raw material on quantity or price discount.

Inventory models are broadly classified into two categories.

I). Deterministic Inventory Models where in demand or lead time are assumed to be constant and known.

II). Probabilistic Inventory Models where in demand or lead time or both are treated as stochastic (random variable).

In this thesis a complete study of important inventory models both deterministic as well as probabilistic is done. Here an attempt has been made to develop software packages for both types deterministic and probabilistic inventory models separately. Software package is developed to have quick answers regarding no. of orders to be placed, ordering cost, inventory carrying cost, no. of shortages allowed total inventory cost and quantity to be ordered. This package is very useful to inventory department of an engineering industry in taking inventory decision so that total inventory cost is minimum. While developing the software the concept of structured programming is used which facilitates inventory control department of an engineering industry to select a particular model depending upon the situation it is facing i.e whether shortages are allowed, not allowed or enjoying the quantity discounts. Having supplied the data accurately it prints out the output as how much to order (EOQ) and total inventory cost etc.

**OBJECTIVES :-**

The main objective of the present study is to develop software for the inventory department of an engineering industry. The other objectives are as follows.

1]. To study available deterministic models and to develop integrated software for the same.

2]. To study available probabilistic models and to develop software for the same.

3]. To test these software for real life data from inventory department of selected engineering industry.

4]. To arrive at useful conclusions regarding application of the software for taking efficient and effective inventory decisions.

**METHODOLOGY:-**

The methodology adopted for the present study purpose is as follows.

The theoretical and historical details about the inventory models in existence is collected together by referring different books on inventory management (the list is given in Bibliography). Then the software for collected inventory models is developed and its validity is tested by considering the solved problems in different books.

Primary data regarding profile of an selected engineering industry viz. Ghatge Patil Industries Ltd. Kolhapur is collected from office of the GPT Ltd, Kolhapur. Having initial discussion with Sr. Officer, Computer Division, it has been decided to collect the data from product side of the company. It has been observed during data collection that the company follows A.B.C. analysis and pays due attention on A-class items.

The company manufactures the following products.

1. FLUID COUPLING
2. ELECTROMAGNETIC CLUTCHES/BREAKS.
3. POWER TAKE-OFF.
4. MECHANICAL CLUTCHES.
5. MARINE REVERSE & REDUCTION GEARS.

There are different types of models under each of the above headings. Some fast moving items belonging to A-class selected at random from the available list of items. Details regarding annual consumption (forecasted) for the year 1990-91 and unit price of each selected product such as EMC-EK 2dcl; are taken from marketing department. The necessary details such as set-up time, quantity on hand, and orders placed etc. required to arrive at different costs is collected from Industrial Engineering Dept. of the company. Then having discussion with manager, cost department, the costing details are collected. In case of some products test data is taken for testing the validity of result.

**LIMITATIONS :-**

The software for both deterministic and probabilistic inventory models is very much useful to inventory department of an engineering industry having mass production. Ghatge Patil Industries Ltd. Kolhapur being job production industry all the computerised models developed are not applicable. In many cases of practical interest the situation may be such that there are limitation on capital invested in inventory, warehouse space or no. of orders that can be handled by purchase department. Software package developed in this thesis does not considers these aspects. One can't use this software under finance restriction; warehouse space restrictions etc.