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Determination of Model Optimal Order Periodic

Mohammadali Keramati[1], Habibollah Javanmard[2] and Vahid Bahmani[3*]

1- Assistant proffessor, Arak Branch, Islamic Azad University, Arak, Iran
2- Associate professor, Arak Branch, Islamic Azad University, Arak, Iran
3- Department of System Management and productivity, Arak Branch, Islamic Azad University, Arak, Iran

***Corresponding author*:** Vahid Bahmani

ABSTRACT: The large inventory of goods, on the one hand, causes capital stagnation and imprisonment of the material properties. On the other hand, a low inventory of materials and supplies for production and goods sale causes disorders and interruptions in business and makes workers, machinery and other resources idle, which may raise consumers' and customers' discontent. In both cases, the production organization would incur loss and material and spiritual severe damage. Using new techniques and methods, managers can determine the cost-effectiveness of each purchase while reducing the costs and increasing the profit. In this review study achieve to a model optimal order from among a number of periodic order models. According to the literature, WW model was determined as the optimal model.

***Keywords*:** periodic order models, inventory costs, optimal model, WW model.

INTRODUCTION

One of the major issues for managers in industrial and commercial organizations is to predict the size of purchases according to the facilities and market situation. In this respect, the cost of materials and the goods required for production as well as the cost of inventory are among the major cost items. By considering the above mentioned managers can determine the cost-effectiveness of each purchase while reducing the costs and increasing the profit.The large inventory of goods, on the one hand, causes capital stagnation and imprisonment of the material properties. On the other hand, a low inventory of materials and supplies for production and goods sale causes disorders and interruptions in business and makes workers, machinery and other resources idle, which may raise consumers and customers discontent. In both cases, the production organization would incur loss and material and spiritual severe damage (Kazemi, 2012).

The main purpose of planning and inventory control to analyze the costs and situations and to adopt the most appropriate policies for orders and inventory in the factories (Hajshirmohammadi, 2008). Ballou estimates that the cost of keeping an inventory in any situation in the year is 20 to 40 percent of the total value of the stock.

However, keeping an inventory is essential customer service and reducing the cost of distribution. Therefore, the management of these inventories on a scientific basis for keeping the minimum of inventory helps reduce the total cost (Ballou, 1992). In periodic order models, the subject of study is the achievement of an optimal policy which can determine how much and at the beginning of which period the stock should be kept so that the total cost of ordering (or pre-commissioning in case of order and production) and keeping is reduced in the whole planning vision (Hajshirmohammadi, 2008).

MATERIALS AND METHODS

METHOD

The nature of a research depends on the methods by which it can be done. Therefore, considering the type and nature of the investigation, carried out a review study.

Review of literature

Inventories and their grouping

Inventory includes raw materials, semi-finished materials, spare parts and products. A proper control of them eases a balanced procedure of the operations. It also plays a determining role in creating greater reliability, more dynamic and safer planning, and more durability against changes (Muller, 2003). In fact, the purpose of planning and inventory control is to determine the optimal level of the stock for minimizing the costs of inventory system and maximizing service level (SeyedHossein, 2005).

Order management is defined as planning, guiding, monitoring and controlling processes associated with customer orders, manufacturing orders and purchase orders (Cox and Blackston, 1998). Regarding their conditions in the course of production, stocks can be divided into five groups as:

1. Raw materials
2. production parts
3. Work in process
4. Finished goods
5. Indirect materials

Classification of goods value

To achieve a classification, a common and useful method called ABC (20-80 method or pareto) has been developed based on which the inventories are classified into the following three categories as follows:

- Class A Items: 20% of items with a value of 80% of the total value of inventories
- Class B Items: 40% of items with a value of about 15% of the total value of inventories
- Class C Items: 40% of items, with a value of about 5% of total inventory value (Hajshirmohammadi, 2008).

Classification of inventories using ABC analysis is one of the techniques widely used in organizations. ABC analysis is simple to use and easy for semi-skilled material manager to understand (Hautaniemi and Pirttila, 1998).

Types of Inventory costs

Types of inventory cost can be classified into four categories:

1. Holding costs
2. Ordering Costs
3. Shortage costs
4. Purchase costs (in case of discounts)(Hosseini baharanchi, 2002).

Inventory management objective

Inventory management is an integrated process which puts in practice the policy of stock valuing chains (Javanmard, 2004). It can be said that companies seek to achieve three objectives:

1. Giving appropriate service to customers
2. Improvement in operating costs
3. Improvement in inventory costs

In inventory management, that policy is considered useful which is simultaneously pursuing all the three objectives (Alamtabriz and Sobhanifard, 2013).

Types of demand patterns

In planning materials, the demand pattern varies in type regarding different aspects. In general, in view of being certain or uncertain and being continuous or discontinuous, demand patterns can be classified as follows:

- Certain – improbable demand patterns
- Uncertain – probable demand patterns
- Uncertain – improbable demand patterns
- Non-periodical demand patterns (continuous)
- Periodical demand pattern (discontinuous) (Mirmohammadi,1388).

Periodical order models

LFL method

In this method, the orders are placed for each periods only as many as to meet the need of the very period. This method is used where the maintenance cost is higher than registration and order cost (Khademizarea, 2004). LFL policy minimizes the stock in the storage and thus helps economize on maintenance costs. None the less, order (preparation) costs will be high in this policy due to the great number of orders (Hajshirmohammadi, 2008).

POQ method

In this method, the quantity of orders is equal to the consumption of a number of future periods. The consumption of these periods approximately corresponds to the quantity of economic order obtained from the well-known EOQ (Odicky, 1975). POQ is a model with the best overall performance (Santoro, 2007).

Least unit cost (LUC) method

In this method, the quantity of orders is equal to the demand of one or more future periods. The quantity of orders and the number of periods that each order covers is not fixed. In this method it is assumed that the use of the stock takes place at the beginning of each period (New, 1975).

Least total cost (LTC) method

In this method too, the quantity of orders is equal to the demand of one or more future periods. The quantity of orders is determined in a way that the ordering costs per unit as is kept, as much as possible, close to the cost of maintenance per unit of goods (Dematteis, 1968).

Least period cost (LPC)

In this method, the quantity of orders is chosen in a way that the same characteristic of EOQ method for regular demand is repeated, that is, in a way that the total cost per time unit is minimized for the duration that the order covers (Silver, 1973). It is shown Silver-Mill method generally operates better than the least unit cost (Baker, 1989).

Wagner-Within (WW) Algorithm

This algorithm, which is designed based on dynamic programming, is an optimal algorithm. This method is aims to investigate the consumptions of all the periods of planning vision at each period and make decisions according to the terms of planning vision. Obviously, the number of possible combinations increases with an increase in the number of planning vision programs. In this method, it is assumed that the shortage of stock is not permitted and the initial stock is zero (Wagner, 1985) to compare Order models, Wagner and Whitin model was determined as the optimal model (Kulkarni, 2013).

Importance of Inventory Management

In the present era, inventory management has been of great importance. In Walter and Gattorna view, this importance is discussed as follows:

The first factor is a major impact that world record has had in decreasing sales size and corporate earnings which has put pressure on managers to reduce inventory levels in the back-up systems for maintaining profit levels. The second factor is the changes in the philosophy of production which obviates the need for stock as a back-up storage for production activities. The third factor, which is associated with the first factor, is that with the major trading activities in the organizations the rate of return on investment is increased; therefore, investment on turnover capital items such as inventory has declined quite tangibly compared to the past (Gattorna, 1998).

CONCLUSION

The cost of keeping an inventory in any situation in the year is 20 to 40 percent of the total value of the stock. However, keeping an inventory is essential for enhancing customer service and reducing the cost of distribution. The main purpose of planning and inventory control to analyze the costs and situations and to adopt the most appropriate policies for orders and inventory in the factories. In periodic order models, the subject of study is the achievement of an optimal policy which can determine how much and at the beginning of which period the stock should be kept so

that the total cost of ordering and keeping is reduced in the whole planning vision. Considering the literature, WW model was determined as the optimal model which can reduce the total cost of Inventory and enhance corporates competitiveness.

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