**Optimizing Inventory of repairable items at single stage operating system**

**INTRODUCTION**

EOQ (Economic Order Quantity) is one of the simplest model to determine the size of the order was introduced by Ford W Harris in the year 1915. The information which the model takes into consideration are: demand, unit cost, reorder cost and holding cost. According to Sherbrooke (2004, 1-2), the EOQ model (also called the item approach) is simple because it deals only with one decision variable which is “when to order or the stock level”. In addition, the stock level for an item is determined by a simple formula which balances the cost of holding inventory, ordering and stock out. Also, Sherbrooke (2004, 3) pointed out that the big disadvantage of EOQ model is that it determines the stock level of one item without considering other items in a system.

J.M. KEYNES differentiated three motives for holding money which can be applied to inventory problems.

1. The Transaction Motive Since outflows are not synchronized with inflows, stocks are needed to bridge these discrepancies. Usually, incoming goods arrive in greater quantities and in longer time intervals than outgoing ones.

2. The Precautionary Motive If an order is placed, one must maintain reserve stocks in order to satisfy the demand while awaiting delivery.

3. The Speculative Motive If prices are expected to rise, it pays to keep stocks on hand.

In operations research (OR), inventory is typically geared towards the first two motives. The third is occasionally treated in linear optimization as the so-called warehousing problem.

Inventory theory belongs to the first and, therefore, classical application areas of Operation Research.

Some of the widely used referenced model for inventory optimization is as follows-

-> Single staged model

-> Multi staged model

**ABSTRACT**

EOQ (Economic Order Quantity) model is a very popular tool for inventory optimization. The institutions and companies are always searching for efficient means by which they can prevent stock out of their products .The project tend to analyze and develop a model in order to execute inventory model for repairable items at single stage operating system.

The inventory model not only help to reduce the inventory holding cost but also help us to check the availability of the system, in contrast to the model for consumable items in EOQ(Economic Order Quantity) model. The constraints which are taken into consideration for optimizing the inventory policy are cost constraint and system availability constraint.

**OBJECTIVE**

The main objective of the project is to implement Single Stage Model for inventory optimization. The result from the program should be able to show an increase in the availability and decrease in inventory cost, in comparison to EOQ model.

**SCOPE OF THE PROJECT**

The data collection method is not as usual for qualitative and quantitative approach. The reason behind this is that the idea is theoretical and acted as a general development of the product. Here the product is basically a software code. The data is not collected from the real world but can be generated for the purpose of users and the authors. For example: The users can change the input data in the program. Also the number of critical items and their occurrences can also be adjusted.