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Title: Mathematical Formulation of Inventory Problems for Stock-dependent Demand

Abstract:-

“Large piles of consumer goods displayed in a supermarket will lead customers to buy more”. This phenomenon is termed as stock-dependent demand rate. It has been observed that the stock level has a motivational effect on the customers. Such a situation generally arises for a consumer-goods type of inventory. Therefore, it may be desirable to order large quantities, resulting in stock remaining at the end of the cycle, due to the potential profits resulting from the increased demand.

In daily life, the deteriorating of goods is a common phenomenon. Pharmaceuticals, foods, vegetables and fruit are a few examples of such items. Therefore, the loss due to deterioration cannot be neglected. Deteriorating inventory models have been widely studied in recent years.

Most of the classical inventory models did not take into account the effects of inflation and time value of money. Perhaps, it was believed that inflation would not influence the cost and price components to any significant degree. However, in the last several years most of the countries have suffered from large-scale inflation and sharp decline in the purchasing power of money. As a result, while determining the optimal inventory policy, the effects of inflation and time value of money cannot be ignored.

In this thesis, an attempt has been made to develop decision policies for the retailer when demand is stock-dependent. The models also consider deterioration of units caused because of mishandling during loading /unloading or climate change or nature of the item under consideration. The main emphasis is given on settlement period which allows flexibility to the player for the payment due against his purchases. It is established that promotional tools like offering price discount or permissible delay in payments attracts more retailers in the supply chain to opt for joint decision instead of independent decision. The joint decision is
advantageous to supplier but not to the buyer. In such a situation price negotiation schemes are advised to go for joint decision.