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Optimal Inventory Policy With Preservation Technology: A New Dimension For Inventory Management

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Abstract:

Inventory control is the most important stage of production management. Products include raw materials, equipment, work, finished products, packaged and packaged goods, and general materials. Studying inventory problems of products with storage methods and requirements is very interesting for easy inventory processing and OR research studies. The aim of this study is to add a new dimension to the modeling of inventory control storage technologies at different demand rates and transportation costs. This strategy aims to develop and describe product models of non-standard products with different needs and various real combinations.

Keywords: Inventory system, optimal policy, preservation technology.

Introduction

Many manufacturing companies with extensive product lines often have product managers responsible for product sales. Effective inventory management, which includes clarifying inventory questions at various locations, is critical to the company's competitive success. Not moving an item can cause delays in obtaining the desired item or equipment, but moving all items in any location can cost a lot of money and lead to unnecessary inventory. Managers often rely on mathematical models and computer systems developed by mathematicians, operations scientists, and industrial engineers to manage product management and problem solving. There are as many models as there are companies, because each model has different standards and limitations. Every company keeps inventory to support its customers. Protecting a product is the concern of every corporate organization. This has the effect of damaging the product immediately, which can be stored in the showroom or warehouse. Most inventory models are created in the database based on a demand level. In real life, it is unrealistic to think that the request is processed on time. Experience shows that higher quality products increase sales for consumers. However, for some goods sold, especially goods, the level of use depends on the level of the goods sold. The consumption cost will increase or decrease according to the products

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available in the system. Retail outlet sales are often directly related to the assortment sold, and it is reported that the assortment sold in a store or in-store can attract or encourage more buyers. These observations have attracted research into modeling the phenomenon. Until now, many business people and doctors were not aware of this benefit. Previous models assumed that storage costs remained constant throughout the inventory cycle. In real business, this is not true. This study will consider the inventory strategy in which the demand level depends on the stock level and the storage price depends on the storage period. To store a unit of product, the cost per unit time is considered as a function of the storage time. Time-varying aspects of the added value of membership, such as later recognition and maturity, are taken into account. Processes will be developed to determine the optimum amount and timing for both pricing systems.

Literature Review

In the last three years, many economists have discovered that in some stores, such as supermarkets, the demand for products can be affected by the products already sold there. Levin et al. (1972) pointed out that the availability of goods has a motivating effect on people's environment and that more goods in the store will make consumers buy more. Silver and Peterson (1985) also pointed out that product sales tend to be directly related to product sales. However, significant analysis of this type means that retail stores will benefit more from higher demand and higher product. Therefore, one of the problems retailers face is the size of the refills and the length of the return cycle. But in real life, the damage is a lot. Perishable foods can be divided into two main categories. Class 1 includes materials that have infinite life and a low rate of damage during wear and tear, such as gasoline, wood, honey, alcohol, and power tools. The second category includes products with expiration dates, such as beverages, vegetables, canned goods, bread, butter, cosmetics, sugar, milk, and most medicinal products. Gupta and Vrat (1986) first developed an environmental consumption model to reduce costs, which assumes inventory-related consumption rates as a function of initial inventory. Padmanabhan and Vrat (1995) also propose a commodity model of perishable goods in which the selling price is dependent on the commodity. Suppose the selling price is a function of available inventory. Wu et al. (2006) provided an additional strategy for non-perishable items, including on-demand inventory and partial returns.

Gupta et al. (2007) developed a genetic application to a market-oriented inventory model with short-run inventory cost and three asking prices tied to inventory. Maintenance is an important part of reducing the effects of wear. In this framework, legal entities/companies will continue to

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strive for innovation in management tools. Hsu et al. (2010) first delivered the Preservation technology idea in their work. They advanced a stock version under the constant demand for renovation generation. Hsieh & Dye (2012) analyzed the impact of renovation funding in a production stock version. Dye & Hsieh (2013) derived a production version under the time-established demand with a controllable deterioration impact. Dye (2013) delivered the non-immediately the deteriorated stock version under renovation generation. Zhang et al. (2014) solved a deteriorating stock version with renovation generation under the stock-established demand. Yang et al. (2015) proposed a renovation stock version under change credit score with a deterioration impact. Zhang et al. (2016) advanced a stock version for the deteriorating item with a renovation facility under not unusual place aid constraints.

In any business, inventory management is now considered a very important part in the market. Therefore, how to manage it and how much to produce and supply according to demand play an important role in this 20th century. Therefore, inventory issues are starting to be studied much more than before. Inventories are stocks of raw materials and finished products. Analyzing inventory issues can minimize the cost and time associated with inventory. There are two types of material on the market. One has damage, loss, damage or decay while the other does not. Items such as radioactive materials, grains, fashion items, medicines, etc. have a limited lifespan, while items such as electronics, steel, wood, etc. have a long lifespan. Deterioration affects stocks and increases stock values. An appropriate inventory model must be formulated to bring the cost of inventory to an optimal level. For a long time, researchers have been trying to get an inventory model that can meet real-world needs. They have solved many stock issues.

The issues relate to the different types of demand in the market, the type of productivity of the business organization, the finite lifespan of the product, the existence of defective production units, tolerance for delays or shortages, overdue, etc. Researchers usually use linear, quadratic, trapezoidal, exponential, time dependent, stochastic dependent, level or stock dependent, price dependent etc. They develop different inventory models by focusing on demand patterns that can be given all the limitations, there are two types of models in this area: by design, one is fixed demand and lead time-based decision making; the other is stochastic or probabilistic, involving different needs and lead times. In the literature review, inventory models with decision-making needs were discussed. Determining the Economic Order Quantity (EOQ) is one of the main factors in creating an inventory model. Replacing cost can be expressed as a variable equation that includes factors such as demand, equipment, production cost, lead time, and other variables. These models help identify the best products, reorder content, and manage out-of-stock

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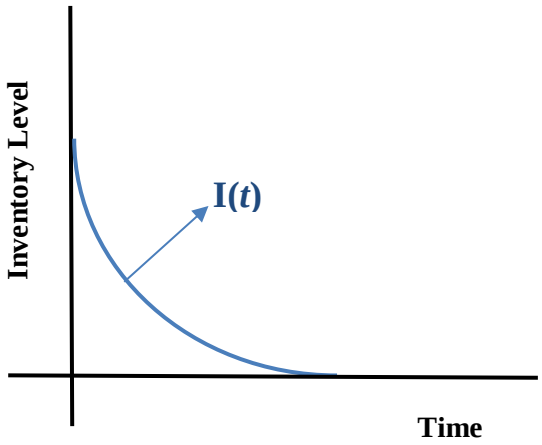
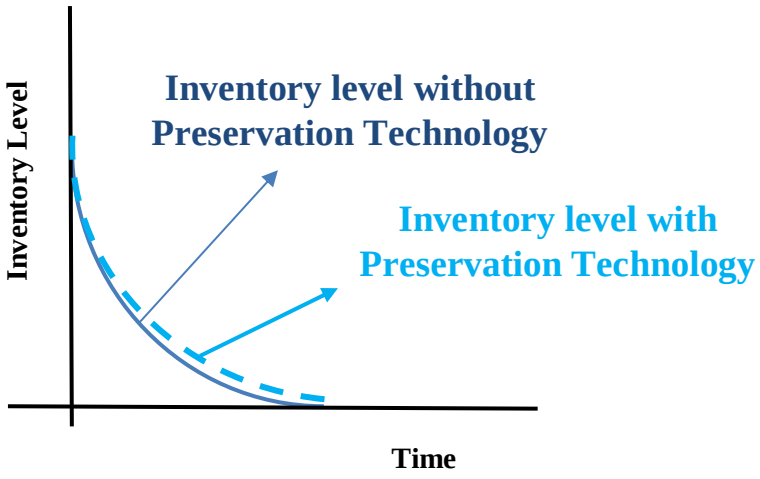
products and performance.



Mishra et al. (2017) offers refurbished stock versions based on insufficient demand determined by price. Also, Parr et al. (2013) and Sheikh et al. (2019) investigated the negative effects associated with fashion products. Lee et al. (2019) evaluated the retrofit production of sudden defective products. Recent advances in manufacturing have reduced losses using inventory management techniques. Gupta et al. (2013) stated that the recommended quality decision to evaluate product quality is the demanding stock level for the product that does not deteriorate immediately. The impact of optimal decision making in product-based products (Kumar et al. 2016, 2017, 2019; Mathur et al. 2019; Malik 2016, 2017, 2018; Singh 2008, 2009, 2010); when reviewing the data.



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Malik et al. (2012), Yadav and Malik (2014) discuss optimization for inventory management. Among these strategies, the stock dependent demand, linear demand, quadratic demand, partial backlogging, two warehouses, non-instantaneous, uncertainty are widely used in inventory management system Kumar et al. (2017, 2022); Malik et al. (2013, 2010, 2011a, 2011b, 2011c, 2011d, 2017a, 2017b, 2009, 2019, 2008, 2022, 2016a, 2016b, 2016c, 2012, 2021a, 2021b); Sharma et al. (2013, 2022,a, 2022b); Verma et al. (2022); Yadav et al. (2022a, 2022b); Singh and Malik (2009, 2010a, 2010b), Singh et al. (2011a, 2011b, 2014a, 2014b), Tyagi et al. (2022a, 2022b), Vashisth et al. (2016). Developing an appropriate inventory model in the face of uncertainty is very difficult due to fluctuations in the market economy and uncertainty in consumer demand. To overcome these difficulties, a model of food production with preservation technology was developed under the risk of uncertainty, using a parametric approach and interval mathematics.

The problem of commercial organizations getting the best products is especially important for food and pharmaceutical companies. The design of preservation technology with inventory system was also addressed by He and Huang (2013); Mishra (2013); Singh et al. (2016); Khanna (2020); Das et al. (2020). In an inventory system, generally three types of cost carrying, shortage and replenishing are significant and control by the right authority. These three types of costs are generally closely related to each other. When one cost is decreased or increased one of the other two costs and sometimes even both may increase there is thus the problem of controlling the cost so that their sum will be lowest. It is a challenging question to control the inventory. Many concepts and techniques were proposed by mathematicians for controlling the inventory effectively.

Conclusion

Here we study and discuss the systematic view on inventory systems with the consequence of preservation technology for perishable products with different realistic situations. As a result, the deterioration is very less or maybe zero whenever we use preservation technology then the improvement in the customer demand due to increasing the lifetime of the products. To obtain a better result in this work-study when we use preservation technology the improvement in a mathematical model and get the better optimum ordering policies.

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