

A Model for Optimizing Inventory Replenishment and Shelf Space Management in Retail Industries

Authors : Nermine A. Harraz, Aliaa Abouali

Abstract : The retail stores put up for sale multiple items while the spaces in the backroom and display areas constitute a scarce resource. Availability, volume, and location of the product displayed in the showroom influence the customer's demand. Managing these operations individually will result in sub-optimal overall retail store's profit; therefore, a non-linear integer programming model (NLIP) is developed to determine the inventory replenishment and shelf space allocation decisions that together maximize the retailer's profit under shelf space and backroom storage constraints taking into consideration that the demand rate is positively dependent on the amount and location of items displayed in the showroom. The developed model is solved using LINGO® software. The NLIP model is implemented in a real world case study in a large retail outlet providing a large variety of products. The proposed model is validated and shows logical results when using the experimental data collected from the market.

Keywords : retailing management, inventory replenishment, shelf space allocation, showroom, backroom

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