RETAIL STORE STOCK INVENTORY ANALYTICS

Title: Optimizing Inventory Replenishment and Shelf Space Management in Retail Stores

Author:Alyaa Abouali, Nermine Harraz, M. Nashat Fors

Year:2014

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.

Title:

The Changing Face of Grocery Retailing

Author:Seong.Y.Park

Year:Dec 1997

Abstract: Over the past few years, grocery retailing has undergone a tremendous transformation which was driven mainly by changing consumer characteristics. In order to accommodate these changes, the industry has responded in three ways. The most important of these is the introduction of new technology, particularly efficient consumer response (ECR). The second change has to do with innovations in product and/or service offerings. The final transformation is the organisational restructuring and the increasing number of mergers and acquisitions in the industry at both the manufacturer and retailer levels. The implications of these transformations on the marketing mix, productivity and manufacturer-retailer relationships are discussed.

Title:

Relationships between inventory, sales and service in a retail chain store operation

Authors: Chris Dubelaar, Deakin University

Garland Chow, University of British Columbia - Vancouver

Paul Larson, University of Manitoba

Year: Mar 2001

Abstract: Effective inventory management is critical to retailing success. Surprisingly, there is little published empirical research examining relationships between retail inventory, sales and customer service. Based on a survey of 101 chain store units, this paper develops and tests a series of hypotheses about retail inventory. Seventy-five percent of the store owners/managers responded to the mail survey. As expected, significant positive relationships were found between inventory, service and sales. Specifically, support was found for the theory that inventory is a function of the square root of sales. Also, greater product variety leads to higher inventory, and service level is an exponential function of inventory. Finally, demand uncertainty was found to have no apparent effect on inventory levels.

Title:

Retail Business Analytics in Store Execution

Author: Timothy.L.urban

Year: Feb 2002

Abstract: Acknowledges that the effect of displayed inventory on retail sales is widely recognized in the logistics, marketing and operations management literature and has been empirically verified. However, neither the marketing literature (shelf-space allocation models) nor the operations management literature (inventory control models) has appropriately modeled this effect. The displayed-inventory news-vendor problem is developed and analyzed, utilizing a simple model to illustrate the interdependencies between the inventory and space-allocation decisions. The model is then extended to the multi-item case, which can be incorporated as part of a comprehensive shelf-management system.

Title:

A joint optimisation model for inventory replenishment, product assortment, shelf space and display area allocation decisions

Author:Abdulrahman Al-Ahmari,King Saud University

Abdel Rahman Hassan Mohamed,Najran University

Year:Aug 2007

Abstract: In this paper, we propose an optimisation model to determine the product assortment, inventory replenishment, display area and shelf space allocation decisions that jointly maximize the retailer's profit under shelf space and backroom storage constraints. The variety of products to be displayed in the retail store, their display locations within the store, their ordering quantities, and the allocated shelf space in each display area are considered as decision variables to be determined by the proposed integrated model. In the model formulation, we include the inventory investment costs, which are proportional to the average inventory, and storage and display costs as components of the inventory costs and make a clear distinction between showroom and backroom inventories. We also consider the effect of the display area location on the item demand. The developed model is a mixed integer nonlinear program that we solved using LINGO software. Numerical examples are used to illustrate the developed model.

Title:

Study on shelf space allocation and management

Authors: Mariane polanti

Micro sutrari

Primo Zingaretti

Year: 2017

Abstract: This paper describes a novel system for automating data collection and surveying in a retail store using mobile robots. The manpower cost for surveying and monitoring the shelves in retail stores are high, because of which these activities are not repeated frequently causing reduced customer satisfaction and loss of revenue. Further, the accuracy of data collected may be improved by avoiding human related factors. We use a mobile robot platform with on-board cameras to monitor the shelves autonomously (based on indoor UWB Localization and planning). The robot is designed to facilitate automatic detection of Shelf Out of Stock (SOOS) situations. The paper contribution is an approach to estimate the overall stock assortment based of pictures from both visual and textual clues. Based on visual and textual features extracted from two trained Convolutional Neural Networks (CNNs), the type of the product is identified by a machine learning classifier. The approach was applied and tested on a newly collected dataset and several machine learning algorithms are compared. The experiments yield high accuracy, demonstrating the effectiveness and suitability of the proposed approach, also in comparison of existing state of the art SOOS solutions

Title: