Inventory Management Challenges for B2C E-commerce Retailers

Authors: Harish Patil , Brig. RajivDivekar[b]

This research was conducted on B2C e-commerce companies or online retailers to study the challenges involved such as demand variations, reverse logistics, seasonal fluctuations, and stockless policy in inventory management and the risks such as lost sales, lost customers, low customer satisfaction associated with the same. This study also includes various strategies to mitigate the risk associated with inventory management of online retailers.

Inventory management practices among Malaysian micro retailing enterprises

Authors: Kamilah Ahmad Shafie, Mohamed Zabri

Inventory management represents a key success factor that shows how efficient a company is controlling its inventories. However, there is little information on inventory management practice in a small business setting. Therefore, this study examines the current state of inventory management practices and factors that influence their use in micro retailing enterprises. A questionnaire survey was employed to gather data from the targeted respondents. Using 100 completed replies, the results demonstrate that most responding enterprises have adopted both unsystematic and systematic inventory management approaches in their business. In terms of inventory management techniques used, 'the rule of thumb' is the most popular among respondents. Meanwhile, EOQ, Bar Code Tagging and VMI are only applied by a small number of respondents. The results also indicate that Purchasing and Controlling are the most frequent inventory management activities applied by micro enterprises as opposed to Storage and Tracing. Finally, the results suggest that owner/managers' attitude and knowledge in inventory management have significant and positive influences on inventory management practices.

Trends in inventory management

Authors: M.C.Bonney

Inventory management is one of the success stories of recent years and it is changing rapidly in response to international competition and new technology. This paper examines some of these developments.

Inventory is a major investment in most companies. It strongly influences the internal flexibility of a company, e.g. by allowing production levels to change easily and by providing good delivery performance to customers. Yet inventory ties up working capital and space and it can suffer from obsolescence, deterioration and shrinkage. It can also add to administrative complexity. In recent years attention in manufacturing industry has concentrated on an 'inventory is waste' philosophy using JIT production, usually accompanied by visible 'pull' or consumer demand driven systems.

INFLUENCE OF INFORMATION TECHNOLOGY, SKILLS AND KNOWLEDGE, AND FINANCIAL RESOURCES ON INVENTORY MANAGEMENT PRACTICES AMONGST SMALL AND MEDIUM RETAILERS IN MALAYSIA

Authors: Tuan Zainun Tuan Mat Universiti Teknologi MARA, Malaysia

Small-medium Enterprises (SMEs) play a vital role in the Malaysian economy. One of the rapidly growing SMEs in Malaysia is the retail industry. One important element in improving the growth of SME retailers is inventory management, as it assists the SME retailers in managing their inventories. SMEs face difficulties in securing financial resources, which inhibits the adoption of computerized inventory systems, as well as limited skill and knowledge in managing their inventory, are among the major problems that causes a less effective inventory management in retail SMEs. Skills and knowledge, and information technology influence inventory management practices of retail SMEs. However financial resources do not influence inventory management practices of retail SMEs in Malaysia suggesting that they do not have problems in getting financial resources as majority of them have received funds from the government.

Inventory Management and Its Effects on Customer Satisfaction

Authors: Scott Grant Eckert1

This study examines inventory management and the role it plays in improving customer satisfaction. It looks at how food companies have been under pressure to streamline their inventory systems, and the consequences of such actions. It also examines how many retailers are trying to implement a “perfect order” system and how suppliers are constantly under pressure to meet the demands of these retailers. Many food companies are, therefore, looking at various inventory management systems as they belief this will have a positive effect on the satisfaction of their customers. The paper also outlines the methodology used in the research and concludes by pointing out the limitations of the research as well as suggestions for further research.

Pricing and inventory management in a system with multiple competing retailers under (*r, Q*) policies

Authors: RuoxiGuan,XiaoboZhao

We consider a multi-retailer system operated on an infinite horizon, in which each retailer faces stochastic demand following a Poisson process and adopts a continuous-review (*r, Q*) policy for replenishing inventory to satisfy customer demand. The system involves decisions of pricing and inventory management with the goal of maximizing profit, which equals the sales revenue minus the purchase and inventory costs. Taking Cournot competition into account, models are formulated to optimize simultaneously the expected sales volumes and (*r, Q*) policies of all retailers. An efficient approach is proposed to calculate the approximate inventory cost. Based on this approach, solution methods for centralized and decentralized scenarios are developed.

Estimating negative binomial demand for retail inventory management with unobservable lost sales

Authors: Narendra Agrawal,Stephen A. Smith

The importance of effective inventory management has greatly increased for many major retailers because of more intense competition. Retail inventory management methods often use assumptions and demand distributions that were developed for application areas other than retailing. For example, it is often assumed that unmet demand is backordered and that demand is Poisson or normally distributed. In retailing, unmet demand is often lost and unobserved. Using sales data from a major retailing chain, our analysis found that the negative binomial fit significantly better than the Poisson or the normal distribution. A parameter estimation methodology that compensates for unobserved lost sales is developed for the negative binomial distribution. The method's effectiveness is demonstrated by comparing parameter estimates from the complete data set to estimates obtained by artificially truncating the data to simulate lost sales.

Retail Inventory Management When Records Are Inaccurate

Authors: Nicole DeHoratius,Adam J. Mersereau,Linus Schrage

Inventory record inaccuracy is a significant problem for retailers using automated inventory management systems. In this paper, we consider an intelligent inventory management tool that accounts for record inaccuracy using a Bayesian belief of the physical inventory level. We assume that excess demands are lost and unobserved, in which case sales data reveal information about physical inventory levels.We also demonstrate the use of this distribution as the basis for practical replenishment and inventory audit policies and illustrate how the needed parameters can be estimated using data from a large national retailer. Our replenishment policies avoid the problem of “freezing,” in which a physical inventory position persists at zero while the corresponding record is positive. In addition, simulation studies show that our replenishment policies recoup much of the cost of inventory record inaccuracy, and that our audit policy significantly outperforms the popular “zero balance walk” audit policy.

Innovation in American retailing, 1919-39: improving inventory management

Authors: Ronald Savitt

The primary purpose of this paper is to examine one of the most important innovations in American retailing, the model stock plan. Proposed by E.A. Filene in 1930, the plan provided a new way to solve previous inventory problems. Building upon past solutions and integrating ideas from 'scientific management', Filene was better able to address the issue of

customer diversity and geographic dispersion. The discussion is placed in the context of 'evolutionary economics', whose framework provides an alternative to the study of retail history. The introduction of this methodology forms the secondary purpose of this study.

The impact of City Logistics on Retailers inventory management: an exploratory analysis

Authors: Carlin, A., Mangano G., Tanda A., Zenezini, G.

City Logistics (CL) can be defined as a comprehensive solution aimed at “totally optimizing” the logistics and transport activities in urban areas, by considering the environment, the congestion and energy consumptionThe adoption of such initiatives by logistics service providers implies a reshaping of supply chains configuration in terms of vehicles used as well as consolidation and reception of goods. In order to bridge this research gap, this paper proposes an exploratory analysis of the perception of the CL issues by apparel and grocery store managers and owners Results show that there is a wide variety of inventory management practices even within an enclosed environment such as the one of a city’s LTZ, and that the adoption of CL innovations by retailers might depend strongly on their inventory policy. Therefore, logistics service providers and local administrations need to take into account such diversity if they intend to scale up CL innovations.

Demand seasonality in retail inventory management

Authors: J.C.F.Ehrenthal[a]D.Honhon[b]T.Van Woensel[c]

We investigate the value of accounting for demand seasonality in inventory control. Our problem is motivated by discussions with retailers who admitted to not taking perceived seasonality patterns into account in their replenishment systems. We consider a single-location, single-item periodic review lost sales inventory problem with seasonal demand in a retail environment. Customer demand has seasonality with a known season length, the lead time is shorter than the review period and orders are placed as multiples of a fixed batch size. The cost structure comprises of a fixed cost per order, a cost per batch, and a unit variable cost to model retail handling costs.Our analysis provides valuable insights on the tradeoff between the complexity of the automatic store ordering system and the benefits of incorporating demand seasonality.

Comparison of benefits of radio frequency identification: Implications for business strategic performance in the U.S. and Korean retailers

Authors: Eun YoungKim[a1]EunjuKo[b]HaeJungKim[c2]Chang E.Koh[d3]

This study explores a model to compare the benefits of RFID technology on supply chain management by focusing on retail industry. A path model was estimated to examine structural relationships among technological infrastructure, RFID benefits, and business

strategic performance in the U.S. (n = 70) and Korean samples (n = 87). Result showed that technological infrastructure was required to more improve inventory management, store operation and demand management, leading to business strategic performance. Hardware/software application was significantly related to the RFID benefit of inventory management for U.S. retailers, whereas, it was related to the benefits of efficient store operation and demand management for Korean retailers. Business strategic performance was significantly determined by RFID benefit factors (e.g., inventory management and demand management) for U.S. retailers and Korean retailers. The managerial implication for business to business strategic performance in the U.S. and Korean retail industries was discussed from a retailer's perspective.

Operations management in multi-channel retailing: an exploratory study

Authors: Andreas Holzapfel & Heinrich Kuhn, Alexander Hübner

Multi-channel (MC) shopping is revolutionizing retail operations. For traditional retailers, the growing importance of online sales means creating new supply chain models. This requires a solid understanding of the operations processes. Current literature on MC management focuses on customer perspectives, but only touches on the operational aspects. The primary goal of this study is therefore to give a comprehensive overview of the operations structures of MC retailing, identify the operations systems in use and analyze their planning interdependenciesThe efficiency of integrating warehouse operations is the core lever for integrated MC operations. While inventory pooling favors integrated networks, channel-specific operational challenges are a reason to simplify structures and operate separate networks. We used an explorative approach to identify structures and processes in a relatively new research area. We questioned 43 executives from 33 different European-based leading companies in MC retailing in semi-structured, face-to-face interviews. This paper describes the results of what is currently the largest study on MC operations.

Positive vs. Negative Externalities in Inventory Management: Implications for Supply Chain Design

Authors: Serguei Netessine, Fuqiang Zhang

In this paper we analyze the impact of supply-side externalities existing among downstream retailers on supply chain performance. Namely, multiple retail firms face stochastic demand, purchase the product from the upstream wholesaler, and make stocking decisions that affect all other retailers in the same echelon. Two sources of inefficiencies exist in such a supply chain: One is double marginalization and the other is externalities among retailers. Whereas double marginalization always leads to inventory understocking at the retail echelon, we find that the implications of externalities are more complex, because different externalities can improve or deteriorate supply chain performance, relative to the situation without externalities.

Optimal in-store inventory policy for omnichannel retailers in franchising networks

Authors: Jianjun Xu, Lanlan Cao

The purpose of this paper is to characterize the optimal ordering and allocation policy for a store replenishment decision in the context of an omnichannel retailer in a franchise network. The authors further show that a myopic policy is optimal, which circumvents the curse of dimensionality for the multi-period inventory model and help store managers optimize their decisions about the amount of inventory to stock for both online and offline demands and the percentage of inventory to reserve for online orders.

Perishable inventory management and dynamic pricing using RFID technology

Authors: A. Chande, S. Dhekane, N. Hemachandra & N. Rangaraj

In price-sensitive markets, price promotions coupled with an appropriate item replenishment strategy can be effective in controlling the total costs of servicing the market. In supply chains that handle perishable products, inventory management is already a complex problem and the management of products in a dynamic-pricing environment is even more challenging. Monitoring and control of time-sensitive products can be facilitated by the application of radio frequency identification (RFID) technology, which enables non-contact, real-time data collection and efficient interfacing with the management control system in the supply chain. This paper describes an integrated framework for inventory management and pricing in a discrete time (periodic review and ordering) framework, and describes an efficient algorithm, including a new approximation, for the related optimization problem.

Pricing and Inventory Management

Authors: Xin Chen∗and David Simchi-Levi†

The purpose of this chapter is to survey academic research on price optimization models in which inventory replenishment plays a critical role. Our emphasis is on integrated produc-tion/inventory and pricing models that have the potential to be used for decision support at both the operational and the tactical levels. We also review strategic models on supply chain competition, coordination and cooperation built upon these operational and tactical inventory and pricing models.

Consumer-driven innovation networks and e-business management systems

Authors: Howard_Cox,_Simon_Mowatt

This paper examines the use of consumer-driven innovation networks within the UK food-retailing industry using qualitative interview-based research analysed within an economic framework. This perspective revealed that, by exploiting information gathered directly from their customers at point-of-sale and data mining, supermarkets are able to identify consumer preferences and co-ordinate new product development via innovation networks. This has been made possible through their information control of the supply-chain established through the use of transparent inventory management systems. As a result, supermarkets' e-business systems have established new competitive processes in the UK food-processing and retailing industry and are an example of consumer-driven innovation networks. The informant-based qualitative approach also revealed that trust-based transacting relationships operated differently from those previously described in the literature.

Integrated Forecasting and Inventory Management for Perishable Products in Retailing

Authors: Anna-Lena Sachs

Presents an optimal inventory Presents a data driven approach that integrates demand forecasting and inventory management,policy for a multi-product newsvendor setting with an aggregated service level targetIncludes several analyses of real data from a large European retail chainAnalyzes behavioral biases for real-world decisions

A process control approach to tactical inventory management in production-inventory systems

Authors: Jay D.Schwartz,[1]Daniel E.Rivera

Supply chain management (SCM) is concerned with the efficient movement of goods through a network of suppliers and retailers. As delayed and uncertain dynamical systems, supply chains provide an excellent opportunity for demonstrating the benefits of control engineering principles to what is traditionally perceived as a "business" problem. This paper presents a fundamental yet practical approach for applying control-theoretic principles to tactical inventory management problem in a production-inventory system, the basic unit in a supply chain. Beginning with the use of a fluid analogy, we present internal model control (IMC) and model predictive control (MPC) as means for generating a series of increasingly sophisticated decision policies for inventory management. MPC policy displays equivalent performance, but incorporates the added functionality of managing inventory in the presence of constraints, an important practical consideration. The MPC policy shows improved performance, greater flexibility, and higher functionality relative to an advanced order-up-to policy based on control engineering principles found in the literature.