RETAIL STORE STOCK INVENTORY ANALYSTICS LITERATURE SURVEY

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TEAM LEADER: CHANDRAPRAKASH REDDY K

TEAM MEMBERS: ADARSH P

AKASH P

GANESHWAR B

Abstract

In recent years, the correct management of inventories has become a fundamental pillar for achieving success in enterprises. Unfortunately, studies suggesting the investment and adoption of advanced inventory management and control systems are not easy to find. In this context, this article aims to analyze and present an extensive literature concerning inventory management, containing multiple definitions and fundamental concepts for the retail sector. A systematic literature review was carried out to determine the main trends and indicators of inventory management in Small and Medium-sized Enterprises (SMEs). This research covers five years, between 2015 and 2019, focusing specifically on the retail sector. The primary outcomes of this study are the leading inventory management systems and models, the Key Performance Indicators (KPIs) for their correct management, and the benefits and challenges for choosing or adopting an efficient inventory control and management system. Findings indicate that SMEs do not invest resources in sophisticated systems; instead, a simple Enterprise Resource Planning (ERP) system or even programs such as Excel or manual inventories are mainly used.

Introduction

Nowadays, organizations, and especially those performing activities in the retail sector, face multiple challenges in the planning and management of their resources. For this sector, having efficient management of human, technological, or material resources refers to the performance that companies characterized by the experience gained in their management could obtain over time. Therefore, the correct inventory management has become essential, especially in organizations dedicated to retail [1-3]. The determination of the optimal inventory level is a fundamental part of the life of organizations due to the high investment that it represents at the time of its acquisition, administration, and maintenance. According to [4], [5], “the role of inventory management is to ensure that stocks of raw material or other supplies, i.e., work-in-progress and finished goods, are kept at levels that provide maximum service levels at minimum costs”. This because the realizable asset occupies a significant percentage within the Total Assets. Hence, its correct ordering and administration imply being able to minimize the risk of contracting results that may put the health of the company at risk.

Results & Discussion

Based on the literature review regarding indicators of inventory control and management within retail companies, 22 key aspects have been identified to

consider when performing inventory management, which could play the role of performance indicators or performance within inventory control and management decisions. All the KPIs identified allow knowing the effectiveness of inventory control and management carried out within retail companies. Among them, the first ten are considered essential due to its higher frequency of employment, while the remaining 12 have a minimum frequency, as shown in Fig. 3. The KPIs identified are: 1) actual inventory and its relationship with the company's information system, 2) inventory level, 3) shortage of scarcity, 4) product reordering, 5) product replenishment, 6) service level, 7) products availability, 8) excessive inventory, 9) items on the shelf, 10) income level – earnings, 11) preference and purchase decision, 12) response level, 13) lost items, 14) returns, 15) complexity and operational performance, 16) proper planning, 17) inventory balance, 18) sales data, 19) verification of the amounts received in stores, 20) incorrect scanning at the time of payment, 21) incorrect deliveries, and, 22) adaptive, flexible inventory.

Current trends

To define the current trends for inventory management in the retail industry, it is convenient to consider critical aspects that allow knowing the effectiveness of the proposed models employing the 22 KPIs presented above. These aspects are identified as key performance indicators of the inventory models. In the study carried out, 22 relevant indicators are established, 10 of them show a higher mention frequency within various studies analyzed. The importance of these indicators is given as a result of the analysis presented above, in which each indicator is displayed and shows its influence over adequate inventory management. Furthermore, these indicators will allow the organization to know the state of the inventory, as well as the model evaluation, which can be used to make continuous improvements to contribute to the business wellness.

On the other hand, the current tendencies in inventory management are primarily focused on developing tools that enable retailers, product location control, loss detection, stock management, cost reduction, and service level improvement. To accomplish these requirements, many studies have been developed over the past five years, whose findings can be categorized into three different approaches. The first approach refers to the tools, protocols, and systems which allow retailers to keep track of their inventory location as well as inventory loss. Examples of tools are RFID, RAIN RFID, Bar Codes, and systems based on previous devices like a Smart shelf system. The second approach refers to algorithms and systems focused on inventory optimization. Trends aiming to find the optimization in inventory management include the

Bayesian Estimation Method, Threshold Accepting and Differential Evolution algorithms, Logistic Information system, and Multi-Channel Distribution Center system. Finally, the third approach focuses on determining the order quantity considering costs and inventory management. The main tendencies applied in retail industries are the IIS, EOQ, JRP, VMI, OE Distribution, Threshold Accepting, and Differential Evolution algorithms, MDP, AUD and IQD policies, and Fuzzy Inventory Management method.

Conclusion

Retail companies have acquired significant importance within several countries due to their high economic contribution. Therefore, the need to analyze their KPIs becomes highly significant, as well as their different systems, methodologies, and tools used within inventory management and optimization. From the aspects mentioned above, the main trends in inventory management within companies were defined.

Regarding KPIs, findings reveal 22 important indicators within inventory management that must be considered when retailers evaluate their stock. Among them, ten primary indicators were founded: inventory level, actual inventory and its relationship to the company's information system, shortage or shortage frequency, frequency of product reordering or replenishment, service level, replacement frequency, product availability, inventory in excess, number of items on the shelf and level of income or profit. These indicators allow the organization to know the state of the stock, to be managed appropriately, and show an excellent service quality and product availability image to the customer. The importance of evaluating an inventory management system using indicators is reflected in the main advantages, i.e., the decrease in monetary loss, higher operating performance, and a higher profit rate.

Overall, the evidence from this study suggests that order quantity, inventory localization, and optimization are the main factors in which the systems, methodologies, and tools are focused. In this context, RFID systems are the most employed

tools in retail industries in terms of solving location issues because they are capable of keeping track of inventory and provide a high confidence level on inventory records. Likewise, in terms of order quantity, systems like the EOQ, JRP, the AUD and IQD policies, and MDP focus on determining the correct order of items to accomplish optimization levels. Indeed, some studies showed that retailers are working with VMI. In this methodology, the supplier controls

the inventory according to the retailer behavior, leading a complete optimization of the SC. Furthermore, the current research came up with algorithms focused on the optimization of the inventory like the Bayesian Estimation Method, the LIS for Omni-Chanel, the Threshold and Differential Algorithms, and Multi Chanel Distribution Center. All these optimization algorithms and methodologies mention the importance of having an integrated information system that allows companies to perform their decision process.

It is important to mention that all retailers may not be able to employ these technologies due to their high cost of implementation and maintenance. To all those retailers with limited resources, cheaper software is accessible that could help with the management of their inventory like bar codes or policies as EOQ, AUD, and IQD, which will allow optimizing their stock without making considerable investments.