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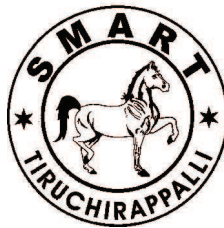Professor **MURUGESAN SELVAM, M.Com, MBA, Ph.D, D.Litt**
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A STUDY OF RETAIL HYPER MARKET WAREHOUSE INVENTORY MANAGEMENT IN MALAYSIA

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Abstract

The objective of this article was to explore a retailer's warehousing inventory accuracy in Malaysia and improve its Warehouse Management System. A qualitative research approach was used to conduct an in-depth case study of two retail hypermarket warehouse operations in Malaysia, which provided data on logistics services. Many retailers made significant investment to improve the inventory accuracy and customised their value proposition to better meet the requirements of the customers. As a result, the role of warehouses has transitioned into managing the stock management between the end-to-end supply chain and retail business. Due to the highly competitive scenario in Malaysia, the retailers are

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continuously forced to improve inventory accuracy, with a warehouse management system-based application, to smoothen the tracking of inventory management. The findings of this study have major implications for academicians and the warehouse industry practitioners in terms of strengthening their understanding of the theories, practices, and solutions for obtaining optimal inventory accuracy. Future research could take up a quantitative study, to examine the relationship between warehouse management system and warehouse operational performance.

1. Introduction

A warehouse in retail industry is conventionally called the supply chain facility or centre that consolidates products to reduce transportation costs and achieve economies of scale in manufacturing or purchasing **(Bartholdi & Hackman, 2006; Severin, Louviere, & Finn, 2001; Kaliappan et al., 2009)** or deliver value-added services and reduce response time **(Gong, & De Koster MBM, 2008).** Retail warehouse operations have recently been identified as one of the key supply chain operations, where warehouse provider companies can offer tailored services to their customers and gain a competitive advantage in the marketplace or provide value-added processes and reduce response time **(Gong & De Koster, 2008).** Throughout this situation, improving order processing cycle times, inventory management and operational performance, are essential. Warehouse Management Systems (WMS), according to **Murray (2012)**, have been available since the introduction of the first computer systems and they were equipped with a simple storage location features and functions. A good inventory management system has high accuracy of inventory record, which means the variances between the physical and virtual inventory are small **(Chuang & Oliva, 2015; Drakaki & Tzionas, 2019; Hachem et al., 2016).** Soon, Malaysian companies will continue to improve their logistics capabilities by implementing activities such as warehousing management, inventory replenishment, and order fulfilment **(Sohail & Sohail, 2003)**. Nevertheless, inventory record inaccuracy appears to be a significant problem across the industries, especially in the retail and manufacturing industries **(Dai et al., 2016; Karim et al., 2018; Rekik et al., 2019).** Therefore, Warehouse Management System (WMS) became essential in the warehousing industry since it provides, stores and reports the necessary information to effectively manage the flow of products **(Faber, de Koster, van de Velde, 2002)**. The need for warehouse automation comes from the fact that manual handling could result in human errors and a thorough study of the system should be conducted in order to automate the process **(Seifermann, 2014; Sundram, et al., 2016)**.

2. Review of Literature

2.1 Warehouse Management System

Although WMS continues to gain additional functionality, according to **Dave Piasecki (2001)**, the initial core functionality of a WMS has not changed. The prime objective of a WMS is to start managing the movement and storage of materials, within a company or organization and to process the transactions. According to **Krajewski and Ritzman (2005)**, warehousing is a sequence of activities or processes that are established to ensure the smooth flow of materials and information. The relationship between warehouse flows must be carefully studied in order to evaluate and improve the performance of these activities **(Nasir Ayub, 2007)**. These functions typically start with supplier receipts and end with customer shipments, with all inventory movements and information flows in between. According to **Baker (2004)**, deploying a warehouse management system is difficult and time-consuming because it necessitates too many trade-off decisions. In order to meet organizational objectives, each warehousing function must be carefully implemented.

2.2 Inventory Management

Inventory is a vital component of current assets, primarily in terms of manufacturing aspects and hence huge funds are committed to inventories, in order to ensure that production flows smoothly to meet the consumer demand **(Lakshmi, 2015)**. Inventory accuracy must be achieved in order to have efficient inventory management **(Atnafu & Balda, 2018; Mohamad et al., 2016)**. Therefore, manufacturing companies now need an effective inventory management system more than ever. Supply chains can never be so well organised, that warehousing can be completely eliminated, despite all the integration initiatives **(Sundram et al., 2018; Mohamad et al., 2016)**. A warehouse management system or WMS, is a critical part of the supply chain, according to **Baker (2004)**, and it is primarily concerned with controlling material movement and storage within a warehouse, as well as handling related transactions such as receiving, put away, picking, and shipping.

3. Statement of Problem

Although there are numerous examples of warehouse management system literature **(Kim et al., 2002; Rubrico et al., 2006),** the implementation of the warehouse management systems (WMS) should focus on improving warehouse efficiency. However, effectiveness of the warehouse management system, in improving the inventory management is yet to be studied.

4. Need of the study

The need of this study is to determine the effectiveness of the warehouse management system in supporting the efficiency of the warehouse operations, especially from the inventory management perspective and to improve the warehouse operations performance practices and process of warehousing industry in Malaysia.

5. Objective of the study

The objectives of this study are to explore the retailer's warehouse inventory accuracy, with warehouse management system, supported by functionality and improving the warehouse operations performance from the supply chain management perspective in Malaysia.

6. Hypotheses of the Study

In qualitative research, there is no hypothesis testing, **Chigbu (2013)** used conjectural propositions (to build a hypothesis), to determine the relation between two or more qualitative variables. Therefore, the present study examined the following propositions.

H-1: Inventory accuracy management positively affects the sustainability of operations efficiency

H-2: Warehouse management system positively affects the inventory management accuracy.

7. Research Methodology

A case study and qualitative research were adopted in this study. This study was an exploratory research, that included qualitative technique, to gather information concerning inventory management under the warehouse management system. Since case studies are usually conducted in a time-constrained context **(Dodge, 2011),** data collection could not be manipulated in this qualitative case study **(Patton, 2002).** The qualitative case study is a naturalistic technique in a specific setting, such as a real-life experience, **(Bashir et al.,2008)** and using words like credibility, dependability, and reliability may be utilized **(Golafshani, 2003)**.

7.1 Sample Selection

The purposive sampling method was deployed to access specific target groups, who possessed the necessary information **(Sekaran & Bougie, 2010).**

7.2 Sources of Data

The sources of data were mainly primary in nature and data were obtained from four warehouse operation managers, from two retail companies.

7.3 Period of Study

This study was conducted over a period of 12 months. The data collection took about 6 months, which included interviews. After data collection, the next process was data analysis to capture the result. **(Table-1)**

7.4 Tools used in the study

This is a qualitative study, where data were obtained via face to face meeting, at the respondents' warehouse site operations in Malaysia and follow up interviews. All data were keyed into NVIVO 12 software.

8. Data Analysis

Creswell (2014) proposed steps for performing thematic Data Analysis in qualitative research and the face-to-face interview probed warehouse management system, focusing specifically on inventory management accuracy. The purpose of this paper was not to draw generalizations but rather to understand the real time experiences of warehouse inventory management in retail industry, using the data collected. **(Table-3)**

8.1 Demographic Factors

All respondents were male (100 per cent). Majority of respondents were in the range of 45 to 55 years (47 per cent). Hundred per cent of respondents reported university qualification. Majority of respondents had been working in warehousing industry, for more than 10 years, servicing the retail hypermarket business. **(Table -2)**

9. Findings of the Study

9.1 Stock Take Management

The warehouse management system presents a good visibility of the inventory holding, indicating the relevant stock keeping unit (SKU), location reference and quantity holding at any point of time. A cycle count is one of important routine tasks of inventory management, measuring the physical inventory and comparing the sum in the system with the record. The cycle count is performed by a dedicated team, with access to inventory management functionality, in the warehouse management system. The cycle count determines the high level of inventory accuracy and stock availability, for the warehouse operations team to meet the daily retail outlets orders.

9.2 Picking Accuracy

The warehouse operations team, which plays an important role in ensuring the picking process, is performed in accordance with the retailer's store orders. The inaccuracy of picking is an error, that happens due to several possibilities such as inbound transactions, picking operations and outbound transactions. As a result of these errors, the organisation would work with inaccurate data and make wrong decisions **(Chuang & Oliva, 2015)**. Interview with the warehouse operation managers, indicated that the warehouse operations team is capable of processing the entire order and execute the picking process, within the planned timeframe of picking hours and able to pick the goods, with minimal errors in the picking process.

9.3 Stock Holding Reconciliation

Many respondents reported that the stock holding reconciliation has improved tremendously, with the implementation of the warehouse management system in their retail warehouse operations. The study, conducted by **Karim et al. (2018)**, revealed that inconsistency in the company's activities, posed inventory management challenges. The stock reconciliation operation was poorly prepared and the standard operating procedures were insufficient, to suit the requirements of the system. This can lead to early stage errors that are difficult to detect and avoid **(Karim et al., 2018)**. Further, **Qin et al. (2017)** analysed the impact of inventory inaccuracy on supply chain performance and found it to be the result of shrinkage as well as the bullwhip effect. Inventory inaccuracy as well as the cost, associated with inventory inaccuracy, can be reduced, through preventative measures, taken through RFID visibility **(Qin et al., 2017)**.

10. Suggestion

The finding indicated evidence of efficiencies in inventory management in retail hypermarket warehouse operations and hence the organisation is advised to review the implementation of warehouse management system.

11. Conclusion

Main objectives of this study were to explore the retailers' warehouse inventory accuracy, under warehouse management system functionality and improve the warehouse operations performance. It was found that inventory management is crucial in every warehouse operation and the efficiency of warehouse operations is important for effective supply chain network in managing the inventory accuracy. The study's empirical findings would facilitate retail hypermarket, in understanding the benefits of warehouse management system, managing inventory accuracy and realizing competitive advantage in warehousing industry.

12. Limitation of Study

Other levels of interdepartmental functions, such as the commercial team, supply chain, and information technology team, were not taken into consideration due to time constraints.

13. Scope for Future Research

Further research could be taken up in the area of commercial team, supply chain and information technology team. This would yield a more comprehensive view on the perception and tactical information from the inventory management perspective, in retail hypermarket in Malaysia.

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Table-1: Retail Hypermarket Operators in Malaysia

Company	Description
Retailer A Sdn Bhd	Established in earlier 1970's, local based company, established with large scale of hypermarket and supermarket concept in Malaysia and subsidiary of international company based in Hong Kong.
Retailer B Sdn Bhd	Established in earlier 2000, international based company, established with large scale of hypermarket and supermarket concept in Malaysia and subsidiary of international company based in United Kingdom.

Source: Retail company secondary source from website

Table-2: Demographic Profile of the Participant in Retailers Hypermarket

Company	Respondent Designation	Gender	Work Experience (Years)	Highest Educational Qualification	Interview Durations (Minutes)	Code
Retailer A Sdn Bhd	Warehouse Manager	Male	>20 years	Bachelor's Degree	60 minutes	R1
	Assistant Warehouse Manager	Male	>15 years	Diploma	55 minutes	R2
Retailer B Sdn Bhd	Warehouse Manager	Male	>13 years	Diploma	75 minutes	R3
	Assistant Warehouse Manager	Male	>10 years	Diploma	70 minutes	R4

Source: Primary Data computed using Nvivo 12 software

Table-3: Theme of Inventory Management in Retail Hypermarket

Themes	Categories	Sub-Categories
High Inventory Accuracy	Stock Take Management	• Daily and weekly cycle count • Agreed timeline for stocktake management • Inventory record accuracy improvement • Minimized stock loss/variance issues
	Database Management	• Database comprises of stock keeping unit, pack sizes, picking type, storage location, allocation and product zones • Improvised stock holding accuracy • Product traceability and information • Inventory visibility and Availability
	Picking Accuracy	• Picking accuracy with system driven • Reduced cycle count frequency with high accuracy • Minimized stock loss and error rate
	Integrity Checks	• Integrity checks on random basis • Improved stock claim from store receiving • Improved trust receiving process
	Inventory Visibility	• Managing large scale of inventory transition • Increased customer confidence in inventory accuracy • Increased Sales, inventory visibility and promotion plan • Order Fulfilment and improved Warehouse service level
	Stock holding reconciliation	• Minimized stock missing, unknown losses and stock adjustment • Inventory reconciliation with customer, accurate and weekly stock holding report • Near Expiry, FIFO Management and Out of Stocks

Source: Primary Data computed using Nvivo 12 software