Warehouse Operations Measurement in Hypermarket Retailers: A Review of Literature

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***Abstract* — This paper aims to explore the warehouse operations measurement with the deployment of the Warehouse Management System of Hypermarket retailers in Malaysia. The warehouse operations measurement is vital for the organisation that manages the total distribution network in hypermarket retailers. A qualitative research approach to be adopted in conducting an in-depth case study in top of the hypermarket retailers in Malaysia warehouse operations located in northern and central Malaysia, offering most of logistics services including transportation and serving a large number of retail customer outlets in Malaysia. The sustainability of the Hypermarket retailers solely depends on the performance of its supply chain process and a balance between responsive and warehouse operations performance with the deployment of the Warehouse Management System. The Hypermarket retailer's warehouse operations are striving to gain a competitive edge, such as fast market penetration, product availability at a right price and at a right place, warehouse productivity and cost competency having alternatives. Presently, there are some general guidelines to measure warehouse operations with the deployment but not specifically towards to Hypermarket retailing industry. The lack of clear measurement and comparability concerns resulted in a study to be carried out in determine the warehouse operations measurement in Malaysia hypermarket retailers, Based on this study, new sustainable Hypermarket retail warehouse operations measurement conceptual framework is proposed to enhance the body of knowledge of warehouse operations measurement in Malaysia, especially in hypermarket retailers.**

Keywords *— Warehouse management system, Warehouse operations performance, Warehouse key performance indicator, Hypermarket retailers warehouse management*

1. Introduction

Retailing begins as a local activity [37], which involves a transaction where the buyer intends to consume a product [26]. The emergence of multinational retailers from supermarket to Hypermarket concepts, especially in grocery retailing, has changed the retail scenario in Malaysia over the last decade. The modern retail environment offers diverse product labels, quality, price and brands [7]. In the past, retail grocery formats such as supermarkets, minimarkets, and night markets dominated the Malaysian retail scene. Consumers will perceive a retailer as a whole rather than in isolation [46]. Retailing is a highly diverse and dynamic sector [18] that provides a supply of most household necessities to the consumer.

Weld Supermarket was the first modern retail format that was introduced in Malaysia in 1963, followed by other modern retailers [20]. The first hypermarket that was introduced in Malaysia was Makro in 1993 [25]. Hypermarket retailing is one of the forms of modern grocery retailing in Malaysia that is experiencing widespread expansion, and the industry is expected to expand continuously and remain immune to the maturity phase. In general, the word hypermarket has still not been defined clearly. The definition for a hypermarket is also being used for supermarket and shopping mall by some researchers.

Consequently, the issue arises from the scholars on how to differentiate hypermarkets, supermarkets and shopping malls. Most products in hypermarkets are based on fast-moving consumable products, and the majority of departments in hypermarkets are selling basic household necessities, grocery lines for example, food, vegetables, kitchen materials, and cleaning materials. In supermarkets, there are more departments that sell durable products.

The concept of everything under one roof, self-service, discount price and free parking have invented a new word in the retail industry of hypermarket [21]. A hypermarket can be defined as a modern household retailing concept that sells a combination of department store merchandise, groceries and fresh produce in wide assortment, within a store of more than 2,500 square meters (27,777.7 square feet) to over 8,000 square meters (86,000 square feet) [29], which includes more facility for the shoppers like free and large parking area and other services.

Hypermarkets are part of the grocery retailing industry and constitute one of the main distribution channels for products [20]. It can also be considered as a normal retailing industry that sells in huge amounts and offers a wide variety within one outlet. Many consumers prefer to purchase household products at hypermarkets [3].

The emergence of multinational retailers from the direct

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foreign investment especially in grocery retailing has significantly changed the retail scenario in Malaysia over the current years. In the past the majority of grocery retail formats such as supermarkets, minimarkets, and night markets dominated the Malaysian retail scene in rural and urban area. Consumers are now given the multi choice of shopping experience in large retail outlets where new retail formats such as hypermarkets, supermarket, and superstores now growing and are increasingly gaining in popularity. In Malaysia the large retail concepts are predominantly associated with multinational retailers such as Tesco, Giant, Mydin, and Aeon in Malaysia. The existing of large retailers brings with it the perception of dominance and implications of changing customer preferences.

According to [27], the country's economic growth is driven by the performance of its main economic sectors, which is summed up by the achievement of each of its respective industries and enterprises. Further strengthening the nation's economic progress, the 11MP MTR 2016-2020 was rolled out with several measures to support economic expansion. The measures focuses on strengthening sector growth and structural reforms, accelerating innovation and technology adoption and providing quality infrastructure. The details shown in Figure 1.

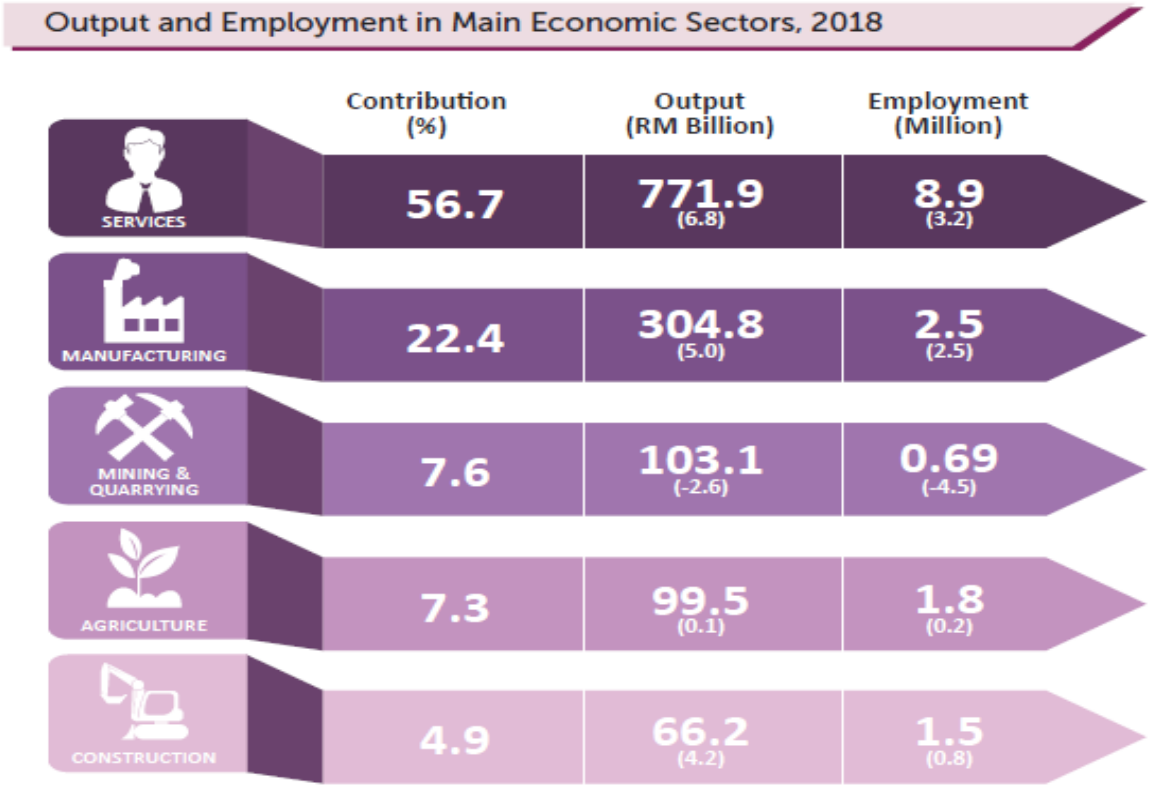

Figure 1. Malaysia Productivity Report in Main Economic Sectors 2018

There are five main sectors on which the economic performance is based on, namely services, manufacturing, construction, agriculture and mining and quarrying. While services, manufacturing, construction and mining and quarrying witnessed growth in 2018, the agriculture sector registered contraction. The services sector remained the largest contributor to the country's GDP at 56.7% with a value of RM771.9 billion in 2018, and also employed the largest number of people at 8.9 million. The second largest contributor at 22.4% was manufacturing sector with a GDP of RM304.8 billion and 2.5 million employees. This was followed by the mining and quarrying sector, which contributed a GDP of RM103.1 billion at 7.6% and employed 69,000 people. In comparison, this sector recorded the lowest employment number among the main economic sectors.

According to [27], for the first quarter of 2018, Malaysia retail industry recorded a below-than-expected growth rate of 2.6% in retail sales, as compared to the same period in 2017. The retail sale growth rate for third quarter has also been revised from 5.2% (estimated in March 2018) to 6.8%. This revision took into consideration the remaining 2 months of tax break before Sales and Services Tax (SST) is to be re-introduced from 1 September 2018. Malaysia's retail industry is expected to record a stronger sales growth this year, especially after the conclusion of the 14th general election.

The Eleventh Malaysia Plan emphasised on creating

seamless connectivity for people and the goods. Within the logistics industry the main focus will be given in developing the integrated logistics and enhancing trade facilitation mechanisms. Strategies that will be undertaken include strengthening institutional and regulatory framework, enhancing trade facilitation mechanism, building freight infrastructure efficiency and capacity, deploying technology in the logistics chain and strengthening capabilities of logistics service providers as according to [30].

Efficient and high-performing logistics and trade facilitation are important determinants of a country's competitiveness. According to [30], the logistics industry is the backbone to the supply chain, and it is recognised as a key to stimulate trade, facilitate business and spur economic growth. In cognisance of Malaysia potential in this industry, Economic Planning Unit (EPU) developed the Logistics and Trade Facilitation Masterplan.

According to [10], under the Eleventh Malaysia Plan (2016-2020), one of the focus areas is unleashing growth of logistics and enhancing the trade facilitation. This will be met through various strategies; among them is the strengthening the institutional and regulatory framework through the National Logistics Task Force (NLTF) and regulating other functions such as off-dock depots, warehousing activities, and commercial vehicle registrations.

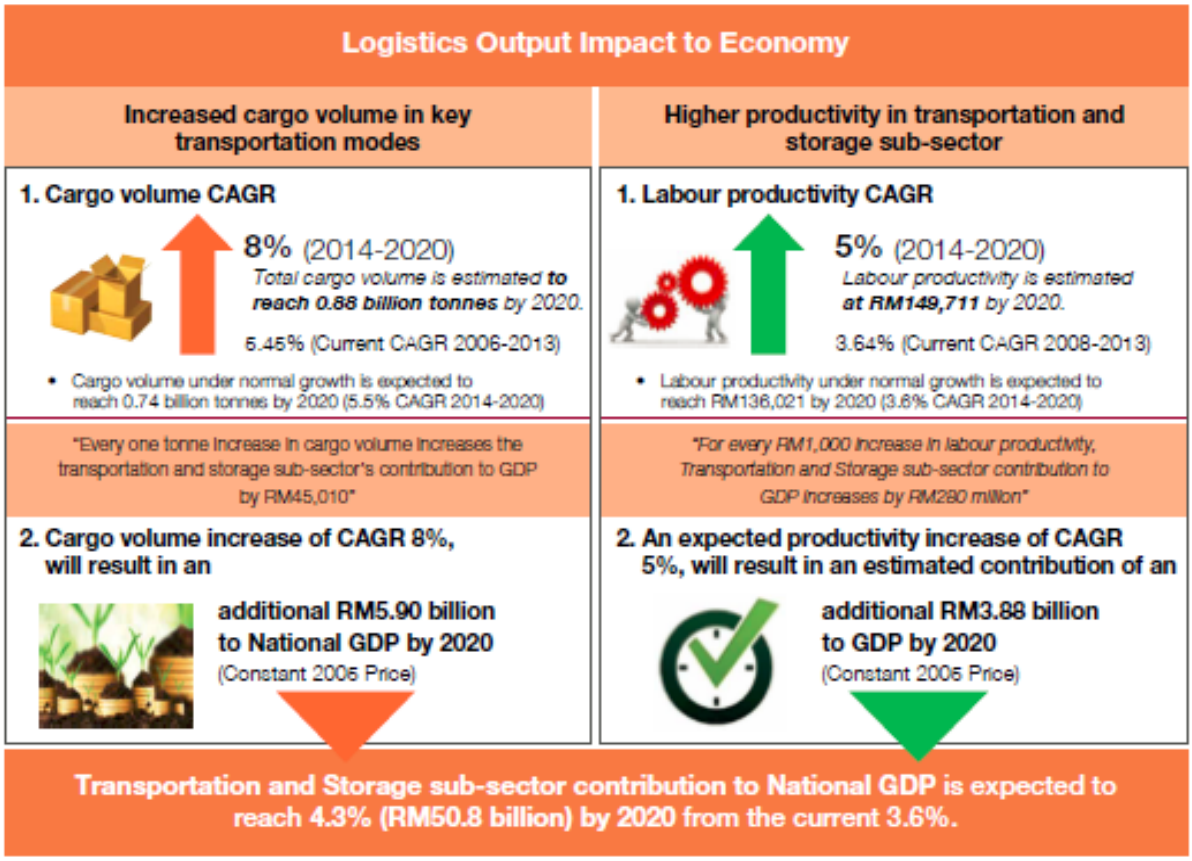

Figure 2. Logistics Output Impact to Economy of Malaysia (2015 – 2020)

According to [27], in 2015, services sector (warehousing and logistics) remained as the largest contributor to the country's GDP at 53.5% to RM569 billion. It was also the largest employer with 8.6 million people. The Services sector is expected to grow at 6.8% per annum and contribute 56.5% to the GDP in 2020, and provide 9.3 million jobs.

The logistics industry is a crucial determinant of Malaysia's competitiveness. Its importance as an enabler and economic multiplier of the nation's trade-dependent and export-oriented economy cannot be over-emphasised. In setting the context for the development of the Logistics and Trade Facilitation Masterplan, a Profiling Study of the freight logistics industry entitled, "Developing an Empirical and Diagnostic Base to Support Strategic Planning for the Freight Logistics Industry" was conducted in 2013 by Frost & Sullivan for the Economic Planning Unit (EPU). The study found that in Malaysia, only 14.9% of freight logistics operators have a warehouse. Of the operators of warehouse services, 86.7% are located in Peninsular Malaysia, while only 3.3% are located in Sabah and 10% are located in Sarawak.

Despite the Logistics and Trade Facilitation Master Plan to develop the country logistics network there is a

significant improvement required for the Malaysia retailer to stay competitive in the market.

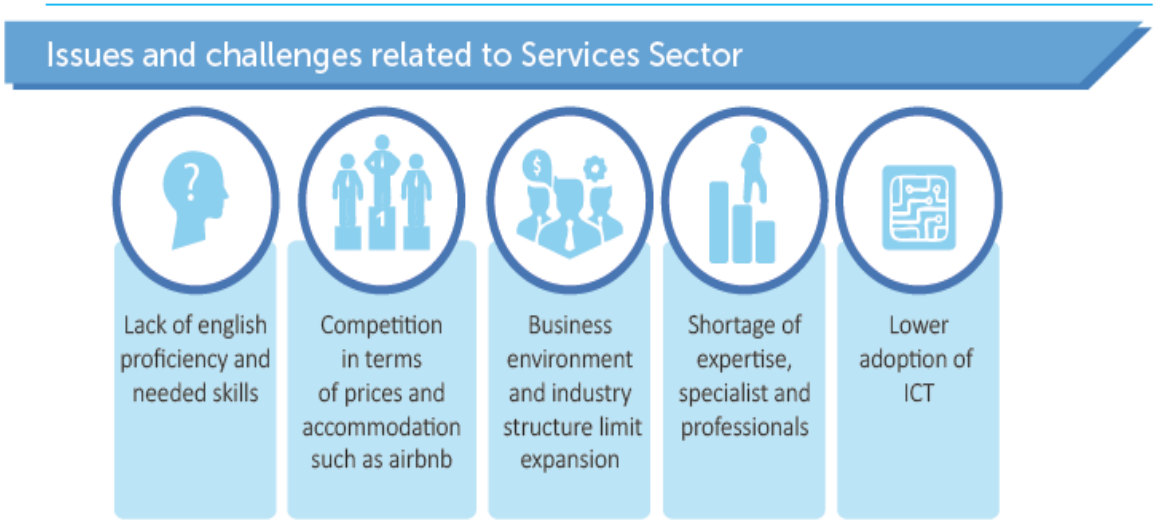

Figure 3. Issues and Challenges related to Service Sectors

However, [10] states that in the Eleventh Malaysia Plan, 2016-2020, the country aspires to be the most preferred logistics gateway in Asia, and to be among the top ten in the World Bank's Logistic Performance Index (LPI) by the year 2020. However, the [28] has claimed that the warehouse industry is less inclined to adopt innovation and improvements that will increase efficiency and productivity than other industries. Thus, the problem investigated in this study is the lack of productivity performance in warehouse operations, which acts as an obstacle to achieving Malaysia's high development ambitions by the year 2020. The adoption of ICT would immersive experience to shoppers, as Malaysian retailers would benefit from adapting to the latest innovations and trends in the industry. While a challenge, it would benefit the business within the sector and boost productivity. Furthermore, the retail subsector relies heavily on low-skill, low wage workers that accounts for over 70% of the subsector's workforce. Increasing the number of employees in managerial or technical roles will help with labour productivity, as quality output can be enhanced.

According to [27], over the course of Malaysia Retail industry transformation, innovation, integration, consolidation and automation will be required to reinvigorate commerce, profoundly impacting the way retailers do business now and in the future. Furthermore, transformation is required to adapt to change in consumers' behaviour, as consumers in Malaysia are becoming increasingly accustomed to shopping online and see this channel as a convenient way to browse and shop.

Many hypermarket retailers in Malaysia have also customized their value proposition to better meet customer demands, which has led to changes in the role of warehouses. In such conditions improvement of order processing cycle times, inventory management and operations efficiency are required to gain the competitiveness in the retail industry. The warehouse operation in hypermarket retailers in Malaysia plays key functions in the supply chain to link the material flows between the supplier and to the customer. As a result of the highly competitive market environment hypermarket retailers are continuously forced to improve their warehousing operations into a system based applications in maximizing the operations efficiency. The warehouse operations should be designed in order to support the retail stores operations towards the customer service, a robust logistics infrastructure with advanced IT platform is necessary which is connected with warehouse product availability and quick replenishment. The warehouse operational measurement is importance for the operations managers to evaluate the operations performance of the warehouse operations and as a supporting tool in make decisions in managing the warehouse operations in an efficient ways. Regarding all this diversity, there is not a consensus of a group of measures used to assess warehouse performance [23].

In today's hypermarket retailer's competitive business environment, the retailers are strategizing to gain market share. The key to success is determined by the roles of logistics function as warehouse is one of the major contributors in ensuring an efficient smooth flow of products and information throughout the entire supply chain [43], [45]. The warehouse operations management is not comprehensively studied until the business globalization process take place [2] in Malaysia. The problem keeps on developing and continuing with the evolution of the logistics roles took place actively during that time [13]. Warehouse operations management (or logistics management in general) specifically are not comprehensively studied until after the business

globalization process takes place in Malaysia [2], [19]. A considerable amount of the studies related with warehouse operations management been published in the international perspective. However, there are limited empirical evidence of warehouse operations management that related with hypermarket retailers been conducted especially in Malaysia perspective.

One of study been conducted in Malaysia by [22] has indicated the three factors lead to Failure Factors of Warehouse Productivity in Malaysian Logistic Service Sector have been identified, i.e. Labour Productivity; Warehouse Utilisation and Inventory Space Utilisation. In the study the researcher has recommended a future studies of warehouse performance as apart from that, the research study can contribute to the ideas, reference and guidance for many upcoming studies related to the warehousing productivity performance.

Till to date, surprisingly the warehouse operations measurement in the hypermarket retailers has not been extensively studied in Malaysia and this studies will benefits the retailer industry in term of the reality of the importance of warehouse performance management with deployment of warehouse management system. The scope of the research will be with top hypermarket retailer operators in Malaysia. The research should elaborates the dynamics of retail supply chain and the spiral affects how the warehouse operations by the retailers played a significant role in total supply chain management. The paper also must reveals the current warehouse operations measurement applied by the respective organisation. A comparison of the current warehouse operations measurement with the available literatures warehouse operations management to be conducted with aim to improve the warehouse operations performances in terms of planning, system and operation with implementation of warehouse management system.

The main focus of this study is to explore the criteria of the warehouse operations management through reorganization of operations efficiency driven by the warehouse management framework. The aim is to take advantage of existing warehouse operations management in the company and apply it to the design of warehouse management system processes. In order to accomplish these objectives a clear understanding of the organisation mission, vision and values need to be further explored. In addition, a comprehensive understanding of the role of warehouse operations in the total supply chain management may be examined to explore the importance of the warehouse operations. On top of that, a warehouse management system modules that deployed in the operations to be studied in determining the distribution layout design to improve the warehouse operations, what are the Information Technology system that able to support the warehouse operation management [17], [41], what influence will value added activities have on order processing times [1], and how can warehouse resources and space be allocated between different product categories in order to optimize material handling efficiency [12], managing the inventory and improve the service level as customer demands [6], [39].

This study may provide a new knowledge to the body of knowledge especially, the decision makers, managers, and policy makers of companies involved in the hypermarket retailers industry. The study may provide a solution towards improving the warehouse operations measurement with deployment of warehouse management system and explore and implementation of effective action plan as a business strategy to overcome or reduce the risks that affect warehousing operations performance.

This paper consists of five parts, the first part of this paper explains in detail of hypermarket retail business in Malaysia and warehouse management process involved in the total supply chain process. The second part consist of extensive literature review relevant to the related the warehouse management system theories adopted for this study. The third section discusses the research methodology, aim and objective. The next part of the research theoretical of warehouse operations management by previous studies and conclusion of this study. In addition, this study can contribute to the ideas, reference and guidance for many upcoming studies related to warehousing productivity performance in Malaysia retailer perspective and may use as a potential reference for future research by academic and industry practitioners.

2. Literature Review

Most literatures has emphasised on the important of the warehouse operations measurement in supply chain process. The warehouse operations measures the operations that is ideal to receive material in an immediately storable conveyance i.e pallets or boxes. The types and volumes of orders that are processed and the number of stock-keeping units (SKU's) in the warehouse are important considerations in determining layout, equipment selection, and business process requirements.

There are large volume of the published studies describing the role of the warehouse operations in supply chain management. Supply chain is the process of effectively managing the flow of materials and finished goods from retailers to customers using the manufacturing facilities and warehouse as potential intermediate steps as according to [36]. The hypermarket retailer warehouse operation plays key functions in the supply chain linking the material flows between the supplier and the customer [35], [40]. As a result of the highly competitive market environment, the hypermarket retailers are continuously forced to improve their warehousing operations into a system based applications in maximizing the operations efficiency.

[14], the ultimate player in this logistics game is warehouse efficiency in real time environment. Many retailers have also customized their value proposition to better meet customer demands, which has led to changes in the role of warehouses. In addition, the integrated supply chain encompasses all the activities from suppliers, manufacturers, distributors and retailers [44], [49]. In such conditions improvement of order processing cycle times,

inventory management and operations efficiency are required to gain the competitiveness in the retail industry. The warehouse operations are designed in order to support the retail stores operations towards the customer service, a robust logistics infrastructure with advanced IT platform is necessary which is connected with warehouse product availability and quick replenishment.

According to [48], Warehouse management system or WMS helps to manage the warehouse operations of a given company or organization. It is considered as an integrated package where in the different components are consists of RF communications devices, hardware, dedicated localized computer, automatic identification equipment together with the necessary applications software. [38] there are different activities and tasks that are incorporated in the WMS, the following are the few: first is that it is responsible in tracking different changes in the status, like the location of the materials or products that are on hold and waiting for inspections or those materials or products that are already released or passed the inspection and are available for the use in the production. [4], warehouse management systems (WMS) are best described as the advanced technology and operating processes that optimize all warehousing functions. These functions typically begin with receipts from suppliers and end with shipments to customers, and include all inventory movements and information flows in between.

[24], explains warehousing comprises a set of activities or processes that are performed to ensure the seamless flow of materials and information. Assessing and improving the performance of these activities requires careful study of the way warehouse flows relate to each other. Important factors influencing process efficiency in the warehousing environment are e.g. layout choices and the policies by which work routines are controlled. [11], explained warehouse or a distribution center is a commercial building used for the storage of goods. The principal element of warehousing is order processing which generally refers to the work flow associated with delivering products ordered by a customer to a shipping carrier. The primary aim for warehouses and distribution centers is to facilitate the movement of goods from suppliers to customers while meeting the customers' demand in a timely and cost-effective manner.

[5], describes a warehouse management system, or WMS, is a key part of the supply chain and primarily aims to control the movement and storage of materials within a warehouse and process the associated transactions, including shipping, receiving, put away and picking. [16] and [31], stated warehouse management today is part of Supply Chain Management and demand management. Even production management is to a great extent dependent on warehouse management. Efficient warehouse management gives a cutting edge to a retail chain distribution company [35].

[33], even though WMS continues to gain added functionality, the initial core functionality of a WMS has not really changed. The primary purpose of a WMS is to control the movement and storage of materials within an operation and process the associated transactions. Directed picking, directed replenishment, and directed put away are the key to WMS. According to [4], warehouse management systems (WMS) are best described as the advanced technology and operating processes that optimize all warehousing functions. These functions typically begin with receipts from suppliers and end with shipments to customers, and include all inventory movements and information flows in between. Warehouse management systems have typically been associated with larger, more complex distribution operations.

[47], described that warehouse efficiency has now become a core competency, a strategic weapon that many companies is using to enhance their position. Warehousing has been viewed as a supportive industry to other functional area but it is regarded as a strategic industry on its own [13].

3. Research Aim and Objectives

[28] has claimed that the warehouse industry is disinclined to innovate and improve its performance, especially in the efficiency and productivity indexes. Thus, the lack of productivity in warehouse operations acts as an obstacle to the achievement of Malaysia's ambitious development objective by the year 2020.

The main objectives of this research are to investigate the warehouse operations measurement that derived from the implementation of the Warehouse Management System. Thus, the study to be carried out and aimed to achieve the following objectives:

- To understand the operational requirement of the Warehouse Management System in the supporting the retailer distribution centre in Malaysia.
- To identify the possible factors that influencing the efficiency of Warehouse Management System in retail Distribution in Malaysia.
- To identify the measurement of the operational efficiencies that contributed towards the implementation of Warehouse Management System.
- To investigate the efficiencies among the Retail distribution of deploying the Warehouse Management System in their Distribution operations.
- To investigate the benefits of Warehouse Management System contributed towards the entire Supply Chain of the Retail Distribution.

4. Research Theoretical in Warehouse Operations Measurement

Table 1 gives an overview of theories in the warehouse operation measurement with deploying warehouse management system. The table summarizes the review based on the dimension of studies carried out by the researchers. For this purpose of study, the research need to

deploy the dimension of warehouse operations measurement in the theoretical framework.

Table 1. Warehouse Operations Efficiency Measurements

Dimension	Indicator	Definition	Authors
Time	Order lead time	Lead time from customer order to customer acceptance	Mentzer and Konrad (1991), Kiefer and Novack (1999), Rimiene (2008), Menachof, Bourlakis, and Makios (2009), Yang and Chen (2012)
	Receiving time	Unloading time	Gu, Goetschalckx, and McGinnis (2007), Matopoulos and Bourlakis (2010
	Order picking time	Lead time to pick an order line	Mentzer and Konrad (1991)
	Delivery lead time	Lead times from the warehouse to customers	De Koster andWarffemius (2005)
	Shipping time	Lead time to load a truck per total orders loaded	Gu, Goetschalckx, and McGinnis (2007), Wang, Chen, and Xie (2010)
Quality	On-time delivery	Number of orders received by customer on or before committed date	Voss, Calantone, and Keller (2005), Forslund and Jonsson (2010), Lu and Yang (2010), Yang and Chen (2012), Kiefer and Novack (1999)
	Order fill rate	Orders filled completely on the first shipment	Ramaa, Subramanya, and Rangaswamy (2012)
	Customer satisfaction	Number of customer complaints/number of orders delivered	Lao et al. (2011), Voss, Calantone, and Keller (2005), De Marco and Giulio (2011), Lao et al. (2012)
	Stock-out rate	Number of stock products out of order	Lao et al. (2011), Yang and Chen (2012), Lao et al. (2012)
	Cargo damage rate	Number of orders damaged during delivery activity	Kiefer and Novack (1999), Lu and Yang (2010)
Inventory Accuracy	Physical inventory accuracy	Measures the accuracy (by location and units) of the physical inventory compared to the reported inventory	Kiefer and Novack (1999), Rimiene (2008), Wang, Chen, and Xie (2010), Yang and Chen (2012), Ramaa, Subramanya, and Rangaswamy (2012)
	Picking accuracy	Accuracy of the orders picking process where errors may be caught prior to shipment such as during packaging	Rimiene (2008), Saetta et al. (2012), Yang and Chen (2012)
	Storage accuracy	Storing products in proper locations	Voss, Calantone, and Keller (2005), Rimiene (2008)
	Delivery accuracy	Number of orders distributed without incidents	Voss, Calantone, and Keller (2005), Gallmann and Belvedere (2011)
	Shipping accuracy	Number of errors free orders shipped	De Koster and Warffemius (2005), De Koster and Balk (2008)
Cost	Labour cost	Cost of personnel involved in warehouse operations	Cagliano et al. (2011)

	Distribution cost	The mean number of vehicles and total travel distance per day provide measures of distribution costs	Yang (2000)
	Cost as a % of sales	Total warehousing cost as a percent of total company sales	Ramaa, Subramanya, and Rangaswamy (2012)
	Order processing cost	Total processing cost of all orders per number of orders	Kiefer and Novack (1999), Rimiene (2008), Ramaa,Subramanya, and Rangaswamy (2012)
	Maintenance cost	Costs of building maintenance Equipment maintenance	De Marco and Giulio (2011), Johnson, Chen, and McGinnis (2010)
Productivity	Labour productivity	Ratio of the total number of items managed to the amount of item-handling working hours	De Marco and Giulio (2011)
	Transport utilization	Vehicle fill rate	O'Neill, Scavarda, and Zhenhua (2008), Matopoulos and Bourlakis (2010)
	Warehouse utilization	The average amount of warehouse capacity used over a specific amount of time	Rimiene (2008), Matopoulos and Bourlakis (2010), Wang, Chen, and Xie (2010), Johnson and McGinnis (2011)
	Picking productivity	Total number of products picked per labour hours in picking activity	Kiefer and Novack (1999), Manikas and Terry (2010), Yang and Chen (2012)
	Receiving productivity	Number of vehicles unloaded per labour hour	Mentzer and Konrad (1991)

The proposed methodology for this study should focus on a qualitative research and a case study. [8], describe the qualitative research a detailed case study methods, inspects the application of case study methods, and also investigates the particular detail and accuracy of case study methods. The primary data were gathered through a questionnaire survey with the relevant person representatives for the top retailers in Malaysia. Questionnaires are considered an efficient method to collect data from the respondents, especially when the researcher knows what is required and how to measure the variables of interest [42]. The qualitative method is applied for this research and all inputs from the respondents are recorded and documented as part of the research procedure.

The population of hypermarket retailer firms in Malaysia in context of warehouse operations that deploying the Warehouse Management System. This implied that the multinational retailers classified as large seized retailers tend to emphasize warehouse operations efficiency with deployment of warehouse management system compared with to smaller seized retailers. These firms are expected to have a high volume of warehouse operations with deployment of warehouse management system into their end to end supply chain process. The minimum requirement for a sample is one variable to ten respondents [15], thus, a respondent size of top retailers are considered sufficient for this study.

For this paper, the unit of analysis of the study is the individual firm that operates warehouse operations with deployment of warehouse management system. The sampling unit is known as a person or a group of people that is used to collect the data for the sampling process [34]. The study is focusing on the measurement used by the firms in determining the warehouse operations performance, the most appropriate respondents will be the Warehouse Operations, Distribution Head and Supply Chain representative of the firm.

Case studies are usually in a form where such research is time constrained, and thus researchers use multiple means to gather data within the limited time frame [9]. This study is in the form of an exploratory research which uses qualitative means to gather data in regard to the warehouse operations efficiency with deploying the Warehouse Management System in the company. Such naturalistic method in this type of qualitative case study studies the subject matter in a context-specific and true setting, where information collection is not be manipulated [32]. Thus, the outcome of this study must be tested and signified in order for this case study to be credible, reliable and valid.

5. Conclusion

As a conclusion, the review of literature together with preliminary exploratory interviews with the top

hypermarket retailer warehouse operations management in Malaysia in revealing the significant influence of the warehouse operations measurement with deployment of Warehouse Management System. Without doubt, it is worth to study what are the warehouse operations measurement that may be further explore in Malaysia Hypermarket retailer perspective. This study would be a subject of interest among the academia, practitioners and policy makers who understand the importance of the warehouse operations management with integration within supply chain management context. The study is hoped to facilitate the importance of the warehouse operations measurement as part of supply chain process, may also add value and enhance the existing body of knowledge on supply chain perspective of hypermarket retailers in Malaysia.

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