

A review of Warehouse Performance in South African Manufacturing Sector

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Abstract

The research conducted in this study is aimed at enhancing warehouse performance in picking by sequence optimization, as the travel time covers most storage collection processes, the right order of picking lines in a batch is critical to attaining high productivity. For research conducted at the manufacturer in the business segment of electronic devices, the quantitative assessment showed an overall improvement potential of 7.4 %, but in contrast to the systematic routing inquiry, the sequences generated by the LSO may seem illogical to the picker-a qualitative assessment must be considered to identify sequence patterns and discuss the methodology. Consequently, the measurements of warehouse performance have become a buzz word amongst scholars and industry practitioners. Despite the fact that the concept of warehouse performance is attending higher level of significance in western countries, America, Asia, due to its ability to smooth the business environment, in Africa, particularly in South Africa the integration and adoption of warehouse performance concept are facing several challenges. To date, over the past decade, a number of research have been done in the past decades to address these issues of warehouse performance in the manufacturing sector and there is still gap in the current literature review, therefore the objective of this research is to review and assess storage performance in the manufacturing industry. The results of the critical analysis of the current literature clearly show that there are flaws in the current body language related to storage performance. However very few studies were carried out from warehouse performance in South Africa, the overall of this study is to fill this gap by means of critically analyzing studies that were developed or conducted in the field of warehousing.

Keywords

Storage, Research, Performance

1. Introduction

Today's market environment is very competitive; the pressure is more on to organizations to find new better ways to add value and to deliver goods to end-user grow even stronger. The expanding demand for companies to compete with its products globally in terms of costing, proper quality materials and other services have had a rise to the desire to come up with more innovative or effective storage techniques. Storing has become the critical function with the increase of mass production systems, storage is where goods are stored and it is a distribution centre for raw and finished materials. Therefore warehousing and distributions centre have similar functions, as goods are stored (Coyle et al, 2003). They both perform vital functions of storage and movements of products (Langevin and Riopel Diana, 2005). The warehouse is the critical function in any company, whereby organizations can supply customized or structured resources/services for their consumers in order to have an advantage over their competitors. This means

that an organization that can receive, store, do cycle counts, stock takes, dispatch, rename racks correctly at the right location, use scanners etc, at a faster rate and get a working culture in order might have an advantage over their rivals. However, there are critical factors and should they not be addressed or managed correctly they might result in a very serious impact in a competitive market. There has been a rise in the delay of end-user service both internally and external. Goods are damaged while in storage. There are excessive movements, this also has led to poor stock take and cycle counts, all this is because of various factors: such as order picking, receiving, how they do cycle counts and Culture plays a critical role in this challenge, because most employees are reluctant to changes especially using technology as they used to do everything manually. Another important factor is that there is no area to store small items such as bolts and nuts, pins etc., so this has led to materials being missing without a trace or accountability. Cycle count and stock takes are done manually which has led to few discrepancies in the warehouse. There is a shortage of specified places to store specialized items, wherever you find a space you can store which is not a good warehouse practice. Racks are not properly marked. The list is endless. Everything has to be looked for instead of just being picked because of the warehouse that lack zone picking among other challenges, in the end, the customers suffer the most.

2. Background

This section covers factors influencing the importance of storage performance. It reviews literature from the past researches; even though several researchers have put a lot of efforts to investigate the factors influencing storage performance, very few have gone further to study the factors that influence the importance of having a warehouse that can give you a competitive advantage over their rivals. The study seeks to review the different models that can improve the performance of modern storage facilities. These are summarized using a conceptual framework. This chapter is aimed at addressing the research design that is relevant to this study. The warehouse can be defined in different ways (Cavinato, 1990), storage generally is a place to hold goods, move them, sorting and transferring from one place to another. While (Spencer, 1993) has a different opinion, that warehouse is a system of production, he further states that storage combines single operations, which culminates in a process as a whole at the end. (Gunasekaran et al, 1999) believe that storage is a combination of more than one material handling process and methodologies such as inventory control and manufacturing control, The better method to describe it, is a quantitative approach. This may be explained as a value that is very objective because it is simple to grasp. According to a warehouse rationale discussed below (John J. Bartholdi, Iii and Steven T. Hackman, 2011): He asked a simple question; why should we have a warehouse, is it necessary to have it? A warehouse requires staff, meaning people, which they all come with problems and challenges, money (area (Land) and facilities and other tools), and other systems such as (IT), and all of them are costly. Can these expenses be avoided? In certain products, the simple answer is a definite NO. Warehouses, and or its stages offer a very critical role and services in any organization and the country's economic growth. Few challenges are as follow: To fully meet end-user ever-changing demand: The main task in such department is that demand changes very fast, but it takes a while to change supply.

3. Gab identification in the current literature

ISI web of science database was used with – (warehouse management system) as the keyword, the search resulted in 825 journals before below steps were taken, 30 best studies related to my topic was filtered and it should also be pointed that studies not related to the topic were not taken into considerations The main objective of this section is to analyze the previous studies and criticize the gabs or evaluate the work that has been done by the author. The analysis will be looking at the core study of the research, the year published, location of the study, the sample size, methodology and the findings of the study in order to increase the reader's knowledge or understanding of the research. To this end, the table below demonstrates the 9 best studies in the field of warehousing management performance. A critical analysis is subjective to a number of steps to be followed and is as follow:

- ✚ Publication year
- ✚ Language selection
- ✚ Source title
- ✚ Country/ region
- ✚ Most cited articles (an average of 9 citations)

3.1 Table of Gab identification

Authors	S M E	L M E	Industry Type			Methodology		Countries
			Manufacturing	Food	Automotive	Qualitative	Quantitative	
Arno Meyer & Others 1995		x		x			x	RSA
Vaidyanathan Jayaraman 2006		x			x		x	USA
H.Y Lam & Others 2015		x			x		x	China
Rui Liu & Others 2015		x	x				x	China
Mark W. Horner 2010		x			x		x	USA
Andre Johnson & Leon McGinnis 2010		x	x				x	USA
Johannes Wollenburg 2017	x			x		x		Germany
Vaidyanathn Jayaraman & Others 2008		x		x			x	USA
Peter Kolarovszki & Vaculik 2013		x	x				x	Latvia

3.2 Critical review of previous studies

Arno Meyer, Wesley Niemann, Justin Mckenzie, Jacques Lombaard, (1995)-Reverse logistics has been seen as a costly exercise before, however, it has seen major attention from practitioners due to ever-expanding competition from competitors. The main objective of doing study for this paper was to discover the internal and external barriers and drivers of (RL) reverse logistics in South Africa's retails organizations. Qualitative methods were used to uncover few facts related to studying and was used in large grocery organizations and cost reduction and barriers were identified and reduced companies environmental impact, however the author should have also used quantitative methods so as to have accurate data and be able to expand readers understanding, mining sector should also be considered as well as barriers to entry is difficult.

Vaidyanathan Jayaraman, Anthony D. Ross & Anurag Agarwal (2006) Closed-loop supply channels are distribution programs consisting of activities that support both the forward flow of goods from the manufacturer to the purchaser and the reverse flow from the purchaser to the manufacturer. During this paper, we determine the reverse supply chain channels that determine the issues faced by corporations after handling product returns on these channels and give the vital role that info technology and collaboration will play in mitigating several of the issues and shortcomings. A key component in reducing uncertainty in the entirely different stages of the reverse channel is access to correct and timely information on the standing, location and condition of the product in the supply chain. It is imperative that companies operating within the reverse supply chain channels work together during a timely fashion to integrate and share info. We provide a case study supported by interaction with two major customers in electronic corporations and show how the use of radio identification device technology during a reposting operation will reduce the organization's overall distribution prices.

The author should also consider using a qualitative method to expand readers' knowledge and also show the scale of each organization consulted during the research.

H.Y.Lam, K.L.Choy n, G.T.S.Ho, StephenW.Y.Cheng, C.K.M.Lee (2015)- End-user orders with large product varieties in small quantities are normally received by logistics service providers with a request for specialized value-added services and timely delivery, so that the storage has to plan its strategy in such a way that it can efficiently maintain its customer expected quality services. Also, the attention has been taken into consideration for the possible danger that can happen while logistics operation is taking place so that any failures can be prevented to avoid possible loss or risks. To facilitate this decision in storage operations, a system is required or suggested, the system will make use of radio frequency identification programme, this system will help in categorizing potential risks factors considered by consumers and formulate a strategy. The author should also specify what methodology is going to be

used and also point out the industry type to increase the reader's knowledge and understanding. Systems show that there is a significant improvement in this programme but no data that's how has it been tested.

Rui Liu, Shan Liu, YuRong Zeng, Lin Wang, (2015) – The aim of this research is to investigate a new pragmatic decision support model of multi-storage coordinated replenishment and delivery (CRD) problem to increase supply chain performance. The proposed model is suitable for directors and managers of organizations to choose the best storage and to decide on delivery planning or schedule. The quantitative approach seems to be used, I use seemed because the author was not specific and also did not specify industry type for readers to have a full or through understanding.

Mark W. Horner, (2010) - Over the past decades, hurricane emergencies were the most dangerous disruptions in the United States, particularly in the country's southeastern region. The key factor in managing hurricane disaster includes logistical scheduling to smooth the distribution and delivery of relief products to people in need. This research shows how a capacitated storage area model adaptation can be used to manage the flow of shipping products to people in need. The model is used in this requisition with protocols set out in the Comprehensive Emergency Plan for Florida and tested in a smaller northern Florida city. However, in much larger or larger environments, it would be useful to also check the scenario, examples explored the results of alternative product distribution strategies on disaster relief provision. Feedback shows that measures describing the accessibility of people to relief products are affected by the distribution infrastructure used to provide relief, as well as assumptions made about the population(s) that are supposed to need assistance.

ANDREW JOHNSON¹, and LEON MCGINNIS², (2010) – Storages are important parts of logistics operations and a vital contributor to speed and cost of the supply chain. Even though there are many acceptable standards for individual storage functions such as order picking, cycle counts, etc, small is known for overall technical effectiveness of storages. Unavailable information or general lack of understanding storage technical effectiveness and related information related to improvement has caused industry limits or ability to identify best practices or opportunities. The main problem is gap in education sector relating to warehousing or lack of professionalism in this field. This study is aimed at addressing this gap by identifying methods to such, by collecting data. The author used large scale operations but never specific to industry type. It is logical to also use quantitative approach and consider a small-medium enterprise as well.

Johannes Wollenburg, (2017) - Objective – These research structures verifiable contributions on various channels in retail operations and logistics that were published until 2015 in order to develop a research schedule at this location. The method used to review is documented or conducted based on recommendation, so it is critical not only to rely on the factual results as they may be inaccurate. Industry sector should also be taken into considerations as well as methodology type, I suggest quantitative analysis should be applied to extend readers mind.

Vaidyanathan Jayaraman (1998) – The aim of this paper is to clarify and test the model of distribution system design and evaluate its performance in terms of results quality, model validity and also the performance of algorithms. This research provides feedback on the development of the logistics model for multiple product storage. The model is used to forecast the performance of distribution organizations that typically have to work with the cost of each product from storage to the end-user outlet, the level of service given to end-users, and the adaptability for each product group and market segment. Qualitative methods should also be considered and also try and use this research on the food industry as there are perishable products to consider.

Peter Kolarovszki, Juraj Vaculík, (2013) - This study explains in competition with storage management systems, RFID technology. The article also deals with automatic technologies for identification and data capture and each process used in the storage management system. It explains processes from product entry into production to product identification, as well as the palletization, storage, bin transfer and storage of goods. The article focuses on the use of AMP middleware in WMS processes nowadays, barcodes are used to identify products in most stores. In this stud, we want to specify how, through RFID technology, the processes described above can be identified. All feedback is verified through measurement in our AIDC laboratory, located at Žilina University, as well as in the GS1 Slovakia Automatic Identification Products and Services Laboratory. Our research results provide a new perspective and indicate ways to use RFID technology in the warehouse management system.

Conclusion

The research is aimed at enhancing warehouse performance in picking by sequence optimization, because travel time covers most storage picking processes, the correct selection of batch lines is critical to achieving high productivity. For research conducted at the manufacturer in the business segment of electronic devices, the quantitative assessment showed an overall improvement potential of 7.4 %, but in contrast to the systematic routing inquiry, the sequences generated by the LSO may seem illogical to the picker-a qualitative assessment must be considered to identify sequence patterns and discuss the methodology. Consequently, the measurements of warehouse performance have become a buzz word amongst scholars and industry practitioners. Despite the fact that the concept of warehouse performance is attending higher level of significance in western countries, America, Asia, due to its ability to smooth the business environment, in Africa, particularly in South Africa the integration and adoption of warehouse performance concept are facing several challenges. To date, over the past decade, several numbers of research have been done in the past decades to address these issues of warehouse performance in the manufacturing sector and there is still gap in the current literature review, therefore the objective of this research is to review and assess storage performance in the manufacturing industry. The results of the critical analysis of the current literature clearly show that there are flaws in the current body language related to storage performance. However, there were very few studies from the warehouse performance in South Africa, the overall of this study is to fill this gap by means of critically analyzing studies that were developed or conducted in the field of warehousing.

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Biography

Nakedi Macdonald Magoro is currently conducting M-Tech Degree in the Faculty of Engineering and the built environment, University of Johannesburg. He holds B-Tech Degree in Logistics Management from University of Johannesburg, South Africa. His research interests involve around warehousing as he discovered challenges that companies face during his long working career in the private sector.