

# **Evaluation assessment of Warehouse Performance in Manufacturing Industries**

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## **Abstract**

The research conducted in this study aims to increase warehouse order picking performance by sequence optimization, as travel time covers most picking processes in storages, it is important to have a suitable order of picking lines in a batch to achieve high efficiency. They argued in their study that routing inquiry for line series in selecting order batches in Warehouse Management Systems (WMS) is well investigated, recorded and implemented. In addition, they stated that storage areas could be an alternative in practice where routing heuristics could hardly be applied. The Line Sequence Optimization (LSO) calculates the line sequence with the minimum travel time for a given batch based on a digitized network. The quantitative evaluation showed an overall improvement potential of 7.4% for a case study at a distributor in the business segment of electronic devices. However, contrary to the systematic routing enquiry, the sequences generated by the LSO may seem illogical to the picker a qualitative evaluation must follow to identify sequence patterns and discuss the methodology with the picking staff. Although a number of studies have been conducted over the past two decades to address these issues in the current literature review, the purpose of this paper is therefore to evaluate warehouse performance in the manufacturing industry theoretically. The results of the current literature's critical analysis clearly show that there are warehouse performance-related flaws in the current body language.

## **Keywords**

Warehousing, optimization, efficiency

## **1. Introduction**

The pressure is being placed on businesses and organisation's, in today's market competitiveness, to come up with fresh solutions to add value and to supply products to clients. Companies increasing demand for cost, proper quality material and other services to compete with their products globally has increased the desire for innovative and effective storage technology. With the growth of mass manufacturing systems, the warehouse has become the critical function of storage and is the retailing center of raw and finished products. Therefore, storage and distribution centers, like products are stored, have comparable tasks (Coyle et al, 2003). Both carry out critical storage tasks and product movements (Langevin, 2005). Warehouse is the key function within any organisation, in which companies can supply their customers with a personalized or organized resource / service to benefit their rivals. So an organisation that gets, stores, counts cycles, stocks, ships, properly renames shelves at the correct place, uses scanners, etc. at a quicker pace and gets an operating culture to achieve a better performance compared with its competitors. There are however critical variables that may have a very severe effect on competition markets if not properly addressed or managed.

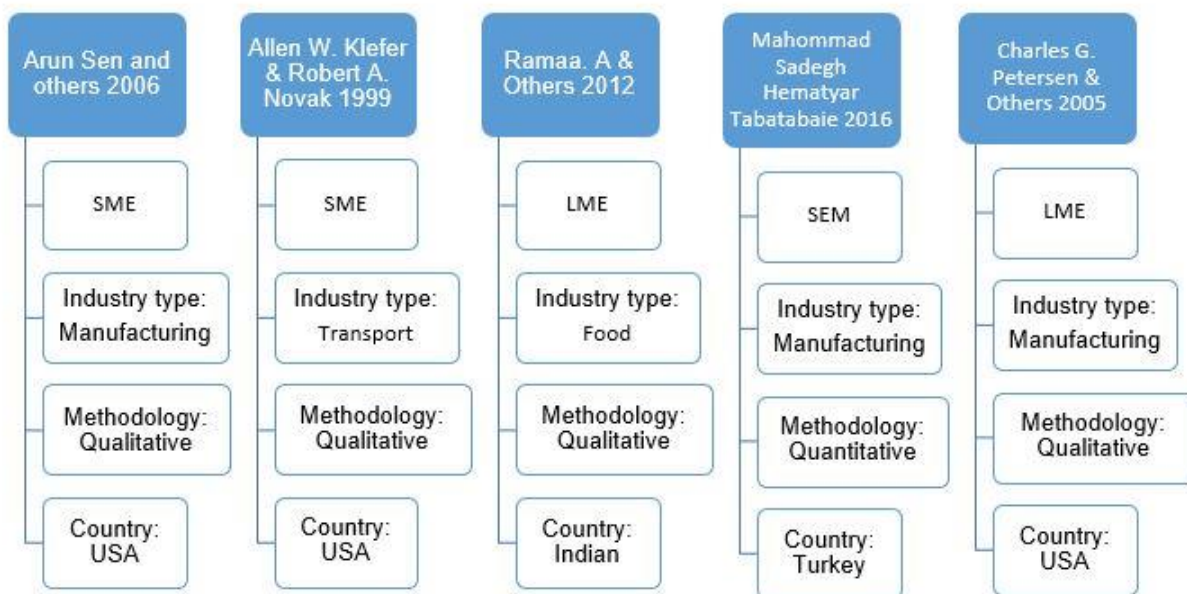
## 2. Background

This section addresses factors that affect warehouse efficiency. While several scientists have worked hard to study the variables affecting warehouse efficiency, few have studied the factors which affect the significance of the warehouse that offers you competitive advantage over your opponents. In this Chapter the literature is reviewed from previous research. The scientists are looking to examine the different models to improve the efficiency of contemporary storage equipment. These are summarized in a conceptual context. This section addresses the appropriate research design for this study. Warehouse is usually used to store, transport, sort and moving products from one location to another. The warehouse can be described in many distinct ways (Cavinato 1990). Spencer (1993), whereas the warehouse is of a distinct view, it is a system of manufacturing. He also notes that the store is a mixture of individual activities, which culminates in the whole process.

## 3. Gab identification in the current literature

The ISI website of the science database was used, with the search result being 1351 publications (Warehouse management system) as a main term, 30 best studies on the theme were filtered, and studies not relating to the subject should be noted. This section's principal goal is to analyze the past research and assess the gaps or the authors' work. In order to increase readers' understanding of the research, the analysis will examine the key study, the published year, its location, the sampled sizes, the methodology and the results of the study. The table below shows the five best research in the field of efficiency of warehouse leadership.

### 3.1 Gab Identity Table



### **3.2 Critical review of previous studies**

Arun Sen (2006) - This article examines all variables that affect the perception of maturity of the data repositioning technique. Repositioning understanding can be a way of speaking of components such as artifacts and workflows, like software development. In software system engineering, the CMM (Capability Maturity Model) has been created to identify entirely distinct software system maturity levels. We use the concepts behind CMM to outline entirely distinct levels of maturity for a technique of repositioning understanding (DWP). It is very essential that the organisation where information are gathered and not fully clarified can be approached and defined quantitatively. Authors should have also recognized the industry type. This document focuses on the social control perceptions of DWP. Organizations that aim to increase the repositioning of their knowledge procedures to many mature levels. In addition, this article identifies many fields for future assessment together with growth of assessment tools.

Allen W. Kieffer Robert A. Novack (1999) - SCM is one of the leading standard leadership concepts for the effect of company and therefore the delivery structure in the 1990s. The problems facing the SCM structure include the lack of evaluation of the SCM, how to execute a SCM program and how to live the SC's performance. A major problem is that procedures with the quadruple measures managed in an excessively supply chain include ED in a larger supply chain, and companies or intermediaries. This assessment can focus on the deposition of the supply chain technique and, in particular, the efficiency of the warehouse (middling) operations of the companies. Two types of companies are used for assessment: supply chain orientation companies and non-supply chain individuals.

Ramaa A (2012) – Storage duties in the supply chain are extremely important as it acts as a link between the fabric flows of the provider and customer. In today's competitive business environment, companies are compelled to enhance their storage activities. Moreover, several businesses have tailored their valued proposition to broaden their client service level by changing the function of warehouses. It shows the results of the research, given to evaluate efficiency and enhance productivity at manual stores through the development of a WMS and an assessment of value profit. Quantitative rather than qualitative method has been used ; other companies such as the food industry will also be considered.

Mohammad Sadegh Hematyar Tabatabaie (2016) – Innovation is one of every element which makes the company more competitive. Innovation in the supply sector has significant benefits for companies. Blessing, such as accelerating the procurement technique, decreasing the deposition or transport costs, the purchase of products and equipment on time, needing fewer people, enhanced security and precision, and so on. The objective of this research was to analyze the factors affecting the growth in structural terms of innovation supply. This study is applied to an AN purpose in which the descriptive survey method and the type of correlation were unwilling to collect the information. The main instrument for the collection of information was a method which backed the spectrum of Likert.

Charles G Petersen (2005) The aim of this paper is to monitor the resentful need of every aspect of the supply chain and of the storage demand, which in the last few years have changed and increased drastically, in order to respond to the changing demand of the end user. This study seeks to assess slot measures and storage methods in warehouses. Given the size of the organisation being investigated, the quantitative method will be more important.

Nelda Johnson (2001) – Healthcare industries have benefited from technology devices such as laptops / computers to operate manufacturing or operational procedures effectively, though information intergradation is presently unchanged according to plan. In the event that patient data is collected accordingly, patience information and other associated information will enhance data precision and accessibility, ensuring reliable data is easily accessible. It will also be simple to produce reports that will contribute to better and quality

healthcare outcomes should research be required in the future ; DM (Data Management) is one of the key points in the healthcare sector. This will also guarantee better quality for future purposes, information can be obtained.

## **Conclusion**

The objective of this research is to improve the performance of warehouse sequence selecting by sequence optimisation, because travel time includes most selecting procedures in storage areas, an appropriate order of select lines in a batch is essential to attain high effectiveness. In their research they stated that routing investigation for line sequence is well studied, registered and enforced in select order batches in Warehouse Management Systems (WMS). They also indicated that in practice storage zones could not be an option to routing heuristics. The Line Sequence Optimisation (LSO) calculates the line sequence on the basis of a digital network with the minimum travel time for a specific batch. In a case research at a retailer in the company section of electronic appliances, the quantitative assessment showed a general enhancement potency of 7.4%. For a case research in a retailer in the company sector of electrical appliances the quantitative assessment showed an general improvement potential of 7.4%. Although a number of research were undertaken in the last two decades to deal with these problems in the literature review, the objective of this article is thus to evaluate warehouse efficiency in the production sector theoretically. The findings of critical assessment of present literature show clear that the present language of the body has defects in relation to the efficiency of the warehouse.

## **References**

- Klaus Moellera, 2011, increasing warehouse order picking performance by sequence optimization literature review. *European Journal of Operational Research* 182 (2007), pp. 1
- Hokey Min, 2009, Application of a decision support system to strategic warehousing decisions. *Literature Review, International Journal Management, College of Business Administration*, pp1
- Vaidyanathan Jayaraman, 1998, An efficient heuristic procedure for practical-sized capacitated warehouse design and management, *International journal of business and economics*, pp1
- Claudia R. Rosale, 2013, Retailer Transshipment versus Central Depot Allocation for Supply Network Design *Decision Sciences Journal* © 2013,pp1
- Vaidyanathan Jayaraman and Yadong Luo, 2007, *Creating Competitive Advantages Through New Value Creation: A Reverse Logistics Perspective*, *International journal*, pp1
- Nelda Johnson, PharmD, 2001, Data warehouse tools: What they are and how they can enhance drug management activities, *international journal*, pp1
- Arun Sen, Atish P. Sinha, and K. (Ram) Ramamurthy, 2006, Data Warehousing Process Maturity: An Exploratory Study of Factors Influencing User Perceptions, *ENGINEERING MANAGEMENT, VOL. 53, NO. 3, AUGUST 2006*, pp1
- Katy S. Azoury, Julia Miyaoka, 2013, *Managing Production and Distribution for Supply Chains in the Processed Food Industry*, 2013 *Production and Operations management journal*,pp1

ALLEN W. KIEFER and ROBERT A. NOVACK, 1999, An Empirical Analysis of Warehouse Measurement Systems in the Context of Supply Chain Implementation, International journal, pp1 Ramaa.A, K.N.Subramanya, T.M.Rangaswamy, 2012, Impact of Warehouse Management System in a Supply Chain, International Journal of Computer Applications (0975 – 8887), Volume 54– No.1, September 2012, pp1

Mohammad Sadeqh Hematyar Tabatabaie, 2016, INVESTIGATING THE ROLE OF ORGANIZATIONAL STRUCTURE COMPONENTS AND ITS IMPACT ON LOGISTICS SERVICE INNOVATION (CASE STUDY: CONSTRUCTION COMPANIES), Online Journal of Design, Art and Communication - TOJDAC August 2016 Special Edition, pp1

Aleksandar Grubor, 2018, Strategic Management, International Journal of Strategic Management and Decision Support Systems in Strategic Management, 2018, Vol. 23, No. 1

Petersen, Charles G;Siu, Charles;Heiser, Daniel R,2005, Improving order picking performance utilizing slotting and golden zone storage, International Journal of Operations & Production Management; 2005; 25, 9/10; ProQuest Central pg. 1

Frida Claesson and Per Hilletofth\*, 2011, In-transit distribution as a strategy in a global distribution system, Int. J. Shipping and Transport Logistics, Vol. 3, No. 2, 2011,pp1

\*, Olof Stenius, Johan Marklund Sven Axsäter,2017, Sustainable multi-echelon inventory control with shipment consolidation and volume dependent freight costs, European Journal of Operational Research 267,pp1

## **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 private sector.

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