

# Review of Warehouse Management System

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**Abstract:** *In warehouse management, modern companies and distribution center are overflowing with information about the transportation and storage of goods and services. Warehouse Management systems (WMS) are often used and fulfil these goals. Current work examines the program as a useful tool for finding and using a WMS. In addition, a research methodology is provided to guide upcoming research on WMS and logistics information (LIS) in general. Meanwhile, inventory management is, in general, the study of determining the structure and location of items in stock. It goes beyond the normal and deliberate manufacture and packaging of goods at different locations on the ground or at different locations in the community. It contributes to Warehouse as we see the latest technology evolve in the field. These studies may be extended from time to time to determine the correct and best practice of WMS at any given time.*

**Keywords:** Warehouse Management Systems, WMS Implementations, Inventory management system, supply chain

## I. INTRODUCTION

A warehouse management (WMS) is a software solution that offers visibility into a business' entire inventory and manages supply chain fulfillment operations from the distribution center to the store shelf. The following year in 1975, J.C. Penney created the first real-time WMS. This was a game-changer. With warehouse stock software that updates stock inventory in real-time, J.C. Penney reduced time spent looking for a product that wasn't there and focused efforts on other areas to grow their business.

**Research Background:** Warehouses play an important role in any shipping process. This article will discuss the key elements required for warehouses to gain value and efficiency in the supply chain and offer some reflection on current and future tensions. What is clear is that the constant changes and changes/challenges in areas such as reverse logistics, environmental security, information technology, and sharing the entire chain together are changing the ideas, roles, and responsibilities of the home. In fact, the term "distribution center (DC)" may be appropriate to represent the many activities in a modern warehouse that go beyond meeting customer needs to provide value-added services. The Inventory Management Widget is a real-time inventory management tool for businesses.

Warehouses sit at the center of producing, manufacturing, and supply chain operations because they keep all the materials used or produced in the one's approaches, from raw materials to completed items. A WMS handles many functions that permit these actions, along with stock tracking, selecting, receiving, and setting away. A computerized warehouse management system simplifies everything from inputting facts to taking inventory. The most effective warehouse system products raise your operating performance, main to extra productiveness It ensures smooth manufacturing operations by using preserving reasonable stocks of substances. It allows normal and timely delivery to customers thru good enough shares of completed products.

The principle purpose of the challenge is to extensively range warehouse management device model software program applications wherein all of the facts regarding the warehouse of the corporation can be furnished. This software provides stability of the warehouse for stable data. Each new stock is created and named with the stock's receipt date and it can be updated at any time as needed based on business or income. The project warehouse management system is a complete computer application developed in Python on the Tkinter framework based on the Turtle library. Use of code visual studio in addition to working with code. This project works with the DB browser and SQLite3.

The widget only collects and adds sales data and provide slow-stock notifications in a specific area in C language. The goal is to focus attention, to solve all the store's problems. Allocation Inventory Control System is a complete computer application developed in Python time using the Tkinter framework of Pycharm Community Edition. WAMP is software

based on the Windows operating system that installs and configures Apache web server, MySQL database server, personal text editor, phpMyAdmin (for managing MySQL databases), and SQLite Manager (for running SQLite databases).

## II. LITERATURE REVIEW

Warehousing costs make up 2% to 5% of a company's revenue. In today's competitive global business environment, organizations are focused on recovering assets, so reducing the cost of goods has become an important business. Adding shipping costs or product rotation to make their products more profitable. An important factor in determining the efficiency of the warehouse is the careful selection of storage space for large volumes of goods in the warehouse. In-depth research is conducted on the various factors affecting the storage industry, such as selection options, sizes and models, materials, products, required features, replacement costs, and regional needs. A suitable station (e.g., random, custom, or beauty-based) and routing method (e.g., Various selection models and response algorithms have also been established to solve warehouse business problems.

Another problem that has plagued the company lately is the number of generations used in the warehouse business. Options range from traditional products – from materials to robots, which use forklifts and even work on racks and racks – to all computer systems using conveyor belts and automated guided vehicles (AGVs). Motivations for choosing at a given time are not static and may differ from the image of the employer or changes in the future market as well as financial, advertising, etc. business or organization [8].

Miebach [12], Matson and White [11], and McInnis et al. [12] analyzed research activities and data transfer data. They concluded that there were significant gaps in the research and that most studies focused on issues of other limitations. In 1992 Goedschalckx created page 1 of WWW with many publications. In 1996, Van den Berg [10] searched the literature on planning products and companies.

## III. FUTURE SCOPE

From drones to robots that collect, package, and sort products without human intervention, technology and innovation will impact the warehouse of the future. Ten years from now, we may see all-electric warehouses run by an elite group of workers.

The need for robots in warehouses is increasing and it is a trend that is expected to increase as technology is used. The Facts and Figures report estimates that the global robotics as a service (RaaS) market will reach approximately \$44 billion by 2028, with an annual growth rate of 16.5%. Warehouse renovation. For example, many companies have started using high-tech, flexible conveyor systems to optimize their multi-story warehouse operations. Having an automated system increases speed and flow rates. Storage facilities in India are expected to double their current capacity by 2022 and nearly triple their 2015 capacity. With the increasing demand for products in Tier 2 cities, investments in the warehouse sector in India may come in the next 4 years.

## IV. SPECIALTY

A warehouse specialist is an executive stocking and warehouse management role for a retail or a department store. Some of the duties of warehouse specialists typically have been:

- Conducting make certain warehouse counting processes to ensure a shipment's accuracy.
- Assess and lead stock rotation procedures.
- Drafting store warehouse space usage.
- Maintaining inventory storage space in the store's warehouse
- Communicating with management about inventory problems that come if products are misplaced or damaged within a loading.
- Led and maintained reservoir records using a warehouse management software system.
- Effective Labour
- Traceable Materials
- Optimized Supply Chain

- Internal Automation Benefit
- Effective Shipment Management providing better Customer Service
- Ongoing Improvement
- Inventory Visibility

**Benefits:**

- Optimized space and lower Operating Expenses Warehouse management systems optimize warehouse flow by analysing the best use of floor space based on the task and material characteristics. In the WMS implementations, the use of space and floor plan analysis is used to determine how space should be best used and provides opportunities for reducing waste – waste of premium floor space and waste of time for locating products. This will also lessen potential costs resulting from excessive material movement, time-consuming placement, and retrieval. By considering the best locations to store products, as well as materials or equipment, a warehouse can lower its operating expenses.
- Using a warehouse management system will also provide visibility of accurate, real-time inventory levels. This enables a company to more securely estimate supply and avoid backorders, which leads to more satisfied customers.
- Materials can be easily traced with warehouse management systems using lot, batch, and serial numbering. Lot/batch numbers indicate the group in which materials were made, and the serial number identifies an item specifically. By use of WMS inventory tracking as previously noted, the ability to match specific lot/batch or serial numbers with incoming receipts and outgoing shipments allows for full traceability. This ability to trace materials lowers any potential redundancy, enables accurate inventory planning and allocation, and provides current retrievable information for either future traceability, service maintenance, or recall situations.
- A warehouse management system optimizes a warehouse's internal operation which can then extend to the broader supply chain. Within the warehouse, a WMS streamlines the entire warehouse process from inbound receipts to outbound deliveries improving operational efficiencies and reducing costs. Warehouse staff achieves fast and accurate shipments by reducing or eliminating unnecessary or non-productive activity. These savings in time and cost coupled with improved processes and information can then be passed along to internal and external partners enabling them to improve their own operations. For example, improved inbound receiving reduces delivery times, enabling delivery partners to better leverage their equipment and resources and shippers to better manage inventory levels. Improved data can reduce risk and increase reliability, benefiting shippers, suppliers, and customers. Data can be shared and leveraged back to an ERP or to a customer, as well as to a TMS (Transportation Management System). The product can arrive to its final customer more quickly while allowing the partners upstream to improve planning. Inventory fulfilment service can be aligned to inventory management; enabling optimized operations while reducing time & inventory carrying costs.

**V. CONCLUSION**

A warehouse management system provides many benefits. These may include real-time inventory visibility, reduced costs, error-proofing, productivity, or efficiency gains. It's true that costs vary from solution to solution depending on your needs. Warehouse Management Systems contain the functions that permit the operation of any random warehouse, as the business increase and as we move into a faster and much more dynamic environment, there is a need to speed up processes in each and every day more demanding. Its main goal is to reduce manpower and increase efficiency as well. Warehouse complexity affects the planning and control structure through the comprehensiveness of the work that has to be done. In highly complex warehouses, feeding organizational actors with the right type of information and knowledge at the right time is difficult. It has each primary item that is used for very small organizations or any commercial enterprise, make it big or small, we should remember the fact that taking suitable care of our inventory could be very crucial.

This is the basic software for small agencies to keep their products in take look at. This system facilitates the user to keep track of all transactions and keep facts with minimum errors. The warehouse is controlled to a specific degree with invoices. A warehouse management system makes the entirety of inputting data to take inventory easier.

#### REFERENCES

- [1]. Pei Yingmei. Research on the construction of a Warehouse Management System based on RFID technology [J]. Science Technology Vision, (2019) [1]
- [2]. Zhang Xinyu. Application of RFID technology in Warehouse Management [J]. Automation and Instrumentation (2017) [2]
- [3]. Dai Xiaorui. Design and Application of Materials Procurement Tracking System based on TWODIMENSIONAL code Internet of Things Technology[J]. Digital Technology & Application, (2019) [3]
- [4]. Ooi Chun Wei, Rosnah Idrus and Nasuha Lee Abdullah "Extended ERP for Inventory Management: The case of a Multinational Manufacturing Company", 2017 Fifth International Conference on Research and Innovation in Information Systems (ICRIIS), DOI: 10.1109/ICRIIS.2017.8002489, July 2017. [4]
- [5]. Xueqing Yu and Lingyun Wei "Inventory management in the e-commerce supply chain with lateral transshipment and quick response", 2018 fifth International Conference on Industrial Engineering and Applications, 978-1-5386-5748-5, April 2018. [5]
- [6]. Amirhosseini, M. and Sharp, G., (1996). Simultaneous analysis of products and orders in storage assignment. Manufacturing Science and Engineering ASME 1996 MED-Vol. 4, pp. 803-811. [6]
- [7]. Ashayeri, J., Gelders, L. and Van Looy, P., (1983). A simulation package for automated warehouses. Material Flow 1, pp. 189-198. [7]
- [8]. Baker, P. and Halim, Z., (2007). An exploration of warehouse automation implementations: cost, service, and flexibility issues. Supply Chain Management 12(2), pp. 129-138. [8]
- [9]. Banks, J., (1990). The simulation of material handling systems. Simulation 55(5), pp. 261-270. [9]
- [10]. J.P. van den Berg. A literature survey on planning and control of warehousing systems. Working Paper, LPOM-96-12, University of Twente, Fac. of Mech. Eng., Enschede, The Netherlands, 1996. [10]
- [11]. L. Gelders and D. Heeremans. Het traveling salesman probleem toegepa It op order picking. Tij&chr~ft voo',- Economie en Management, 39(4):381-388, 1994. In Dutch. [11]
- [12]. J. Miebach. Die Gnmldagen einer sYBteTnbezogenen Plan'l.tng von Sf'iickgutlagern, dargestellt am Beispiel des K ommissionierlagers. PhD thesis, Technische UniversiUit Berlin, Germany, 1971. In German. [12]
- [13]. Inventory Management Software for Windows in Python Amogh Singh<sup>1</sup>, Vimal Negi<sup>2</sup>, Aaditya Tirodkar<sup>3</sup>, Nida Parkar<sup>4</sup> 1234Computer Engineering, Atharva College of Engineering/ University of Mumbai, India) [13]
- [14]. The solution of warehouse management. BEIJING VISION ELECTRONIC TECHNOLOGY CO, LTD, 2004. [14]
- [15]. Jayanth, S.; Poorvi, M.B.; Sunil, M.P. Inventory Management System Using IOT. In Proceedings of the First International Conference on Computational Intelligence and Informatics, Hyderabad, India, 28–30 May 2016; Satapathy, S.C., Prasad, V.K., Rani, B.P., Udgata, S.K., Raju, K.S., Eds.; Advances in Intelligent Systems and Computing. Springer: Singapore, 2017; pp. 201–210. [Google Scholar][15]
- [16]. J.P. van den Berg. Aliterature survey on planning and control of warehousing systems. Working Paper, LPOM-96-12, University of Twente, Fac. of Mech. Eng., Enschede, The Netherlands, 1996.[16]
- [17]. L. Mc Ginnio, J. Trevino, and .LA. White. A bibliography on material handling systems analysis. Technical Report MHRC-TR-83-06, Georgia Institute of Technology, 1983.[17]
- [18]. Matson and J.A. White. Operational research and material handling. Eumpean Journal of Operational Research, 11:309-318, 1982.[18]