

RESEARCH ARTICLE

THE IMPLEMENTATION OF WAREHOUSE MANAGEMENT SYSTEM (WMS) TO IMPROVE WAREHOUSE PERFORMANCE IN BUSINESS TO BUSINESS (B2B)

Karishma Shanmugamani*, Fazeeda binti Mohamad

Faculty of Industrial Management, Universiti Malaysia Pahang Al Sultan Abdullah, Lebuhraya Persiaran Tun Khalil Yaakob, Gambang 26300 Pahang, Malaysia

ABSTRACT - As one of the key steps in the manufacturing supply chain, warehousing is in the position of controlling inventories. The success of realised goods movements can often be measured by how well warehouse activities are carried out. The goal of this study is to identify the problems with inventory management in warehouses and to install WMS to enhance inventory control in a warehouse setting. In industries such as manufacturing and other forms of production, efficient warehousing and management of inventory is essential. A systematic evaluation is used throughout the literature to investigate warehouse operational challenges and how they impact performance measures. As clients develop increasingly sophisticated and require precise, safe, and rapid information communication, this study develops and comprehends the usage of technological advances to support the business and incorporate trustworthiness, control, and flexibility into the daily operations of warehouses. The main goal of this study was to enhance the work management system of the organisation. The outcomes from this study offer a few helpful suggestions on applying WMS practises within the organisation.

ARTICLE HISTORY

Received : 01-06-2023
 Revised : 22-06-2023
 Accepted : 26-07-2023
 Published : 21-12-2023

KEYWORDS

Warehouse
Supply chain management
Manufacture
Warehouse Management System

1.0 INTRODUCTION

A key enabler of Malaysia's expanding commerce and rapid economic expansion is the logistics sector. Its significance as a facilitator of the country's export- and trade-driven economy cannot be overstated. The marketplace's need for logistics infrastructure and amenities in Malaysia continues to be rising year after year from business parks, free-standing storage facilities/depots, and distribution parks. Yet, localised logistic companies also help to improve logistic effectiveness in Malaysia as a result of the knowledge that logistics performance significantly affects a company's productivity and the nation's outputs (Rashidi & Cullinane, 2019). In basic terms, the demand is driven by the pressing need for businesses to supply the right items in the correct amount, at the right location, and at the correct moment to remain competitive and prosper in their markets. Although there are many spectators in the value chain and a fragmented market landscape today, market consolidation is anticipated, and the creation of two primary groups of logistics service providers is anticipated. Transportation, supplies, storage facilities, distribution, and information sharing are all typical tasks managed by logistics businesses (Khan, Jian, Zhang, Golpîra, Kumar, Sharif, 2019). Many possibilities for providers of logistics services have emerged as a result of the increasing significance of effectiveness and a concentration on basic skills. Customers now want quicker times for delivery and more precise services. As a result, logistics service provider control becomes more complicated. Performance metrics can help with complicated system administration.

Numerous optimisation examines are used to design modern logistical warehouses and distribution centres. These days, warehouses require a lot of attention. According to Cakmak, Gunay, Aybakan, and Tanyas (2012), a warehouse is a place where materials, semi-finished goods, and finished products are obtained, moved or stored, harvested, sorted, and collected, pass-docked, and shipped in. Minimising the manipulation of materials is the main goal of material flow control. The following guidelines must be followed in order to make the handling of materials cost-effective: manipulation should be kept to a minimum, movement of material lengths should be kept as short as feasible, and item flow should be uninterrupted with few breaks. The primary operations in a warehouse involve receiving, putting away, storing, packaging, and shipment. Receiving includes a process that includes assigning vehicles to docks as well as planning and carrying out offloading activities. This activity also involves handling materials and confirming the product's installation and material position. The choice of an appropriate warehousing system is a present-day research area since it affects the capacity and utilisation of the warehouse as well as the pace of storage activities (Šaderová, 2019). Warehousing is the transfer of goods from the landing zone to their intended location. Order preparation is called order picking. This is thought to be the primary and labour-intensive function of warehouses. Packing after picking, assigning vehicles to ports where the orders are, and loading trucks are all aspects of transportation.

The issue is that warehouse space is not being utilized to its full potential. Considering an effective organisational approach enhances all aspect of a firm, an organised warehouse is certain to have greater overall performance, productivity, and KPI (The Most Common Warehouse Logistics Problems, 2021). High likelihood of shipping error including, without limitation, any goods shortage, damage, picking error, overage, labelling error, and ordering error, call for optimizing operations like put-away, picking, packing, storage, shipment, and receipt. The goods needed for manufacturing processes are kept in a production or manufacturing warehouse. These facilities are used to store and supply semi-finished goods, production parts, components, and raw materials. Many goals, including internal and external logistics, resource planning, material handling, storage, and inventory management are considered.

A crucial aspect of management is inventory. It is a pillar of the supply chain and logistics management in the system for asset management (Abimanyu, Wawan, & Erry, 2019). Since that stock is monitored and measured by countless organizations every day, this is remarkable. The main connection in the supply chain between manufacturers and consumers is warehousing. It offers manufacturing operations a buffer to handle changing client demand. Almost 50 percent of overall of all (non-automated) warehouse operation costs are labour-related. Due to the changing nature of the workload and the deadline-driven nature of many tasks, particularly export work, it can be challenging to estimate the actual workforce in retail facilities.

The industry ABC Company makes goods from raw materials using machinery or manual labour, usually in a structured manner with a division of labour. Typically, manufacturing takes place on a huge production line using equipment and experienced labour. The primary raw material utilized in the fabrication of corrugated cardboard by ABC Corporation is corrugated cardboard raw paper. Modern marketing developed significantly because of the industrial revolution in packaging. Containers, cartons, and bottles produced in large quantities served as the foundation for mass markets. Making boxes is a predictable component of the manufacturing industries that are used to package finished goods for handling and shipping. On the other hand, cartoon boxes are the inexpensive packaging material, which will be helpful for companies that use cartoon boxes for packaging purposes, but there are certain issues that are happening in the company.

With increased internationalisation, logistics is becoming more and more important. All businesses are subject to intense competition, and in this environment, logistics plays a key role. Logistics enhances customer service while lowering costs and increasing revenues. With the advancement of information technology, logistical efficiency is increasing (Straka, Rosova et al., 2018). This is the rationale for a decision to introduce Warehouse Management System (WMS) to the organization that is severely struggling with warehousing issues. A contemporary warehouse must monitor and measure its inventory to function effectively. It is a crucial component of the management information system of an organization. The system for warehouse management, for instance, manages location control far better than the inventory control system does. In accordance with user-defined restrictions on the use of product zones, random location control enables the system to maximize the utilization of the warehouse's available space. Incoming flow handled, product to location assigning, material handling, order to stock location allocation, order batching and release, order picking, order packing, benefit logistics activities, and shipment are among the warehouse processes that must be planned and regulated

The business-to-business sector's current warehouse management systems sometimes have trouble handling high-volume order processing, which leads to delays, errors, and higher operational expenses. The goal of this study is to create a reliable and expandable warehouse management system that makes use of automation, advanced analytics, and customer fulfilment to increase operational efficiency and inventory correctness in business-to-business warehouses. The warehouses of every business or link in the supply chain are essential. After carefully weighing the relevant business issue, it is necessary to take this action. Lacking a warehouse management strategy in the business made warehouse activity chaotic. Due to a lack of precise and current information on the stock level of its carton boxes, the company has inefficiencies beyond having an inadequate or excessive amount of stock in its warehouse. This increases the risk of buying inaccurate goods from suppliers or selling false merchandise.



Figure 1. A stressful and hectic warehouse without a WMS being introduced

Manufacturing enterprises capitalise on WMS to organise the company's storage facilities and handle finished goods, work-in-progress inventories, and inventory of raw materials. It enables effective order tracking, inventory control, and collaboration among both manufacturing and shipping. WMS is essential for businesses that manage the preservation, transportation, and distribution of commodities. To ensure prompt and correct delivery, it controls the amount of inventory, monitors deliveries, and optimises the operation of the warehouse. When study are understood, the duration of a transaction is greatly shortened. A chain of supply consists primarily of transactions. If the logistics industry does not work, the supply chain also is unsuccessful, which interrupts business operations. Utilising a WMS minimises errors caused by humans and enables distributors to accurately and actively handle their stock. An absence of knowledge regarding the WMS application and its relevance while beginning warehousing operation can have an effect on the business. Little investigation and understanding of what the system offers into both the benefits and obstacles that WMS offers, without why clients are much less likely to keep buying from the company and may even move on to other firms that can ensure timely shipping are one of the elements that can be enhanced as well as changed from this study. Implementing WMS is technology that assists businesses in managing and controlling routine operations in warehouses from the point at which products and resources enter the warehouse or completion facility until the point at which they left.

1.1 Research Objectives

- i) To determine the issue in warehouse operations in business to business (B2B).
- ii) To recommend the implementation of (WMS) in improving the warehouse performance.

1.2 Scope of study

Improving inventory monitoring and traceability is one of a warehouse management system's key objectives. Clients can expect to be helped by the company with items and commodities which the company desires and maintains with respect to important stock information. The goal of this study is to discover how to operate a warehouse by speaking with corporate managers about how they are interested in implementing WMS to enhance various warehouse operations. Three months were needed to finish this study certainly. The organisation should establish its business limits in order to perform at its highest level, provide clients with effective service, and still feel relaxed and energised.

1.3 Significance of study

This study offer fresh perspectives on how the warehouse management system can be used to monitor and manage all stock better. The corporation will soon be able to provide customers with products and services thanks to this study. The employees choose and maintain current operation with pertinent stock information. This will help them to transfer goods throughout storage facility as quickly as possible, enhancing each step of the fulfilment procedure while also adding efficiency, consistency, and quality management to the process in the long term. In addition, the analysis offered in this investigation provide important data for subsequent studies on warehousing management during business-to-business transactions by enhancing its efficiency.

2.0 LITERATURE REVIEW

2.1 Warehousing industry in Malaysia

Malaysia is a prosperous nation in transition that is moving closer to becoming a developed country in its own right. Malaysia exemplifies outstanding leadership in terms of economic growth and development. Distribution centres, often known as warehouses, are places where goods are distributed again to wholesalers, retailers, or consumers directly. A warehouse serves more purposes than just housing inventory. As a result, the warehousing sector is taking on a more important position in the logistics-related business. A corporation may occasionally need a number of kinds of storage facilities, such as those for raw materials, semi-finished goods, finished goods, etc. Each of these entities have to be set up in accordance with their individual operational requirements, as well as the limitations and possibilities of each place and its surrounding area. According to Johnson et al. (2017), warehouses are an essential component of any supply chain. The goals of warehouse management include improving accuracy and productivity while lowering and controlling transportation and inventory costs. Warehouses are a crucial link in the supply system.

The aim of warehouse operations is to meet customer needs and requirements while efficiently utilising available space, resources, and labour. The products need to be safe and safeguarded (Fumi et al, 2013). This is done by integrating value-added services into the warehouses rather than concentrating solely on storage. A large number of orders went out in just a couple of hours, which were all filled in a short of days. It is a common premise among researchers looking at inventory issues that the market demand probability distributions are fully understood. In reality, though, this supposition is rarely true. In light of changes in consumer psychology and purchasing power, among other things, it may be challenging to estimate future demand (Li & Shou, 2021). Considering the extent of the piece of property or building, the planned capability, the activities that must be carried out, the required staff and resources, the movement of supplies, and the potential for expansion, the warehouse space that has been allocated to each region must be acceptable. In any case, a thorough analysis of the demands of the organisation will determine how to customise the construction and the layout of certain spaces inside the installation. In order to promote, enhance, and ensure operational excellence, the management

of a warehouse is the systematic day-to-day administration of operations in a warehouse. Managing a warehouse entails keeping an eye on all of the moving parts, including personnel, training, supplies, tools, security, and protection.

2.2 *Issues / Challenges in Warehouse Operations*

An effort is made to research warehouse operating difficulties and how they affect indicators of performance by conducting a structured evaluation of the literature, which includes high-quality publications, handbooks, bulletins, doctorate theses and dissertations, conferences reports, and other internet-based sources. The goal was to thoroughly evaluate the body of research with an eye towards understanding how various warehouse operations are connected and might be improved. Company pace, effectiveness, and efficiency of a specific warehouse activity as well as the entire network of related processes can all be impacted by difficulties in the warehouse, which has an impact on the overall flow of the business. Most often, these mistakes are not discovered until after the procedure has started, or after it has ended. And at that time, it is typically too late to correct the mistake. In some cases, it is even too early to reduce the damage that has been done. One of the numerous issues at a warehouse may involve inadequate inventory management. Due to the possibility of workers going to a site whereby the product is not available, picking issues arise. The same can occur if goods are stored in a space that is already filled. Traditional methods of maintaining records of inventory result in inaccurate stock information, the accumulation of outmoded inventory, and labour-intensive physical inspections and corrections of errors. For example, one of the most significant challenges in warehouse order management is the amount of inventory that can be provided, but synchronising the information needed for that is a major obstacle (Kembro & Norrman, 2019). Placing a purchase order under the impression that might have enough inventory to satisfy it, only to discover that you do not is risky. Inventory have the option of creating a backorder, which dramatically lengthens the lead time for your order.

Quality control occasionally suffers when there are so many sales flowing through and going out every day. As a result, quality control in the process of supply chain is necessary to maintain an edge in the market while reducing operational costs. Waste accumulates to an intolerable degree in the absence of quality management. Employees can fail to pay attention to important details during choosing, packaging, or shipping owing to the stress associated with completing orders fast. As a result, customers may receive improperly packed goods. Inventory damage occurs when an item is harmed, which results in expenses for warehousing operations. As advised, using a pallet that can be raised, stowed, and covered can prevent this. Ensure that walkways are brightly illuminated and spacious enough to allow people to easily move through the goods sell. These precautions will assist in safeguarding staff, property, and inventory and in preventing workplace mishaps. In the course of carrying out various procedures, warehouses might produce a lot of data. Although such data can be too big to handle and analyse manually, it still contains valuable information for raising warehouse efficiency and effectiveness. One of the most crucial operations that takes place in a storage facility is warehouse management, which one cannot afford to get wrong. Since most warehouse management tasks are interconnected in some capacity, a problem in one can result in expensive mistakes in the others in addition.

2.3 *Applications of WMS in Warehouse Operations*

Companies require reliable technology solutions to support the company and incorporate dependability, speed, control, and adaptability into the operation of warehouses as consumers become more sophisticated and demand accurate, secure, quick data interchange. The term real-communication skills are essential in today's rapidly developing technological environment. The chain of distribution may be slowed down or disturbed, for instance, if the initial supplies are not received correctly or parts disappear in a warehouse. WMSs are essential in making sure that these procedures go well by keeping track of inventory and ensuring that things are correctly stored, sorted, transported, and monitored (O'Donnell, 2020). One has extraordinary transparency and immediate insight into every action taking place in the warehouse thanks to these kinds of warehousing systems. In order to reduce inefficiencies, a decent system for managing warehouses will even assist in creating computerised lists according to orders that have merchandise stored adjacent to one another.

A dataset-driven computer programme called a warehouse administration system (WMS) is intended to improve warehousing efficiency and productivity by guiding traffic and preserving high inventory accuracy through the documentation of warehouse operations. On the basis of information acquired in real-time regarding the status of dustbin utilisation, the tools have also directed and supervised the stock holding. A WMS can efficiently process data and plan moves inside the warehouse. It can generate reports and manage significant transaction volumes, just like in e-commerce operations. Incorporating cutting-edge technology into your business can help businesses satisfy rising client needs while also enhancing company ability to compete in a difficult market. WMS technologies include components of software that support inventory management, warehouse operation oversight, labour cost reduction for manual jobs, and service to clients enhancement. A contemporary WMS should be compatible with current enterprise applications and support portable devices (Jenkins, 2023). The correct WMS may boost accuracy, physical space utilisation, and worker productivity to the fullest extent. These must all be evaluated, measured, and presented with the return on investment report. Nowadays, mobile workforce makes it crucial for the network to be remotely available through the internet and secure, locked with a password access level. It goes without saying that any system used by the organisation needs to be able to retrieve information.

3.0 METHODOLOGY

This study is a research exploratory project which employs qualitative methods to gather data regarding how companies with business-to-business warehouse have adopted the warehouse management system's method. Comprehensive descriptions for particular investigation methods are provided in this portion, along with an analysis of their application and an examination at how precise and thorough the study are. A method of interviewing with a particular organisation, such as ABC company, or the usage of social networking websites as an information and data gathering tool were used in a qualitative case investigation to seek out and examine incidences and occurring within a certain event. This kind of case study has a constrained and distinct reach, and the researcher themselves serve as the research tool. A pair of interviews and an analysis of the literature were employed as research approaches in this study. Through reliable interview sessions, numerous evaluations of the available literature were obtained because those evaluations had similarities or relationships to the topics. In addition, lower- and top-level managers with solid comprehension make up the respondents from the conversations. Getting more comprehensive and in-depth knowledge about WMS systems of data was another goal. The investigation of storage kinds of goods and features, current sites, and the determination of the warehousing process are all done in the subsequent step.

3.1 Case Company

In the year 1990, ABC Company was established, and it now operates at Jalan Kasawari 4, Taman Eng Ann in Klang, Malaysia. The business that has engaged with this present research is a manufacturing and warehousing firm. For ABC Company to succeed in its goals, it requires efficient management of both manufacturing and warehousing processes. Manufacturing involves a complex set of activities such as procurement source determination through vendor evaluation criteria, production planning and optimizes the production process using industry-standard techniques to deliver quality products with minimal waste. Quality control ensures that products conform to established industry standards. Product assembly is then carried out according to set guidelines.

Although ABC Company strives hard towards timely productions beneficial cost-effective manufacturing practices, there still seem intractable issues in their current system. The role played by warehousing operations at ABC Company is just as crucial since it involves receiving goods from vendors or returned orders from clients which then go into inventory before being sold. Notably, ABC Company produces a variety of goods ranging from carton boxes to pallets and metals amongst others. Managing inventory levels effectively helps maintain optimal stock levels whilst reducing costs linked with carrying excess stock should such an issue arise after demand falls short or customer ordering times increase beyond normal expectations; fulfilling orders promptly avoids backorders whilst ensuring customers remain satisfied with prompt deliveries thanks to later-stage distribution services by delivering reliable shipments regardless of location worldwide.

Despite these challenges, the correct measures can ensure proper warehouse management through clearly defined procedures whilst adequate forecasting models assist companies achieving quicker lead times before delays become too significant to avoid preventing delivering goods to clients on time.

3.2 Flow of research

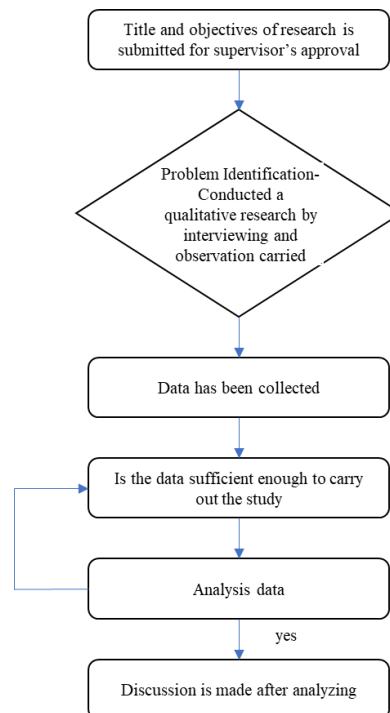


Figure 2. Research flow chart

4.0 RESEARCH FINDINGS

Finding and implementing WMS techniques within the firm is the primary objectives of this study. The attention will now shift to outgoing motions as the study explore somewhat further into WMS. WMS is going to direct company where to keep the inventory. The outbound order of purchase is slotted first in the sequence. Once that has an instant order, WMS examines at demanding orders for the coming days and may assign a portion of the arriving quantity immediately to the shipment port. The cross-docking is the practise of never storing an entering quantity into a trash can, which significantly reduces manpower costs and storage needs. WMS will recommend dustbin placements close to the moment particular an in-stock product will require after reviewing everything in the warehouse and considering all past and present requests for the stock as time goes on. Products with a great deal of interest are going to be kept in the main area of the warehouse, while those with a lack of interest are being moved to the side. WMS installation helps businesses cut back on laborious processes including data entry while reducing errors and increasing handling efficiency. The administration of workforce and efficiency in warehousing can be enhanced through the implementation of a complete warehouse management system. It is critical to pick an easy-to-use approach that will not increase staff tension if company wants to increase worker productivity. The system should have a wide range of features while also being simple to navigate and guiding individuals through the procedures to make learning easier. WMS also increases warehouse precision. WMS can track each item's movement in immediate detail, reducing the possibility of loss and keeping correct inventory. A Warehouse Management System (WMS) reduces errors by removing human data entry and providing a single source for inventory data. To confirm the components, amounts, and placements of your purchases, a WMS may utilise the scanning of bar codes and voice picking. In order to guarantee that the company shipments adhere to the requirements and specifications of the clients, it can also offer quality control inspections, packing guidelines, and labelling standards.

A WMS can connect to freight the carriers, couriers, and other logistics companies to offer immediate insight and notifications on the state and whereabouts of the deliveries. To serve clients and customers, it can also produce and distribute tracking numbers, verification emails, and provide delivery reminders. Utilising software for warehouse management makes it a lot easier to operate at maximum effectiveness. The term real-stock management can help businesses organise picking and replacement and respond to variations of demand with a WMS. The business that run will always have adequate inventory on hand to satisfy customers with this digital an approach even if sales are very strong. The enhancement of the shipping and receiving processes is a key benefit of employing a WMS. Companies that have a WMS set up can automate a large percentage of their shipping and receiving operations, reducing the possibility of errors and reducing time as well as cash. A WMS additionally assists firms by providing real-time information into their business activities, which can help company improve existing delivery and arrival processes. Another major advantages that WMS offers is flexibility. The capacity to handle incoming items and assure correct examination, tagging, and counting can be greatly enhanced by organising the process. When keeping the commodities is not necessary, another approach called crossing moves the materials right away to an additional dock for shipment. This approach offers an additional means of implementing effective utilisation.



Figure 3. A warehouse in an organised manner using WMS

ABC Company is in a favourable way by enhancing its information handling processes. Companies can acquire, store, and evaluate important information about their business activities with a WMS in place. This can assist them make informed decisions regarding their firm. The programme also integrates easily with already-in-use processes and systems. First off, a warehouse management system may assist a company in cutting operating costs. If employees are able to employ a WMS to determine the best spots for items, supplies, and devices, operational costs for a storage facility are reduced. Increased inventory visibility may result in less immediately stock being kept on hand by a company. A business

save money by not having a place to keep goods. By adding an initially-in, immediately-out rule, which ensures that oldest perishables are removed first, a WMS may additionally decrease waste. A system for managing a warehouse may prioritise the priorities for an assignment, for instance, by placing the best workers in more advantageous locations to meet the deadline. WMS makes use of labour planning to effectively allocate the appropriate personnel to the appropriate machinery at the right moments in time. A business might opt to roll out its WMS in stages so that it can benefit from the latest innovations and run as effectively as possible. To make sure that the following steps can be completed, a warehouse administration system must manage the essential fundamental data (Liang, Wu, Zhu, & Zhang, 2020). For businesses who want to improve productivity and simplify operations, WMS deployment is an essential stage. The setting up of a WMS might be tricky, nevertheless, and there may be numerous challenges to solve. The primary difficulty businesses encounter during the process of setting up phase is choosing the appropriate WMS. It may seem challenging to choose the best WMS for the business from among a number of numerous alternatives on the market today. Finding the ideal mix amongst hard and flexible standards during WMS installation presents an additional challenge for businesses. Because regulations reduce the framework's flexibility, strict rules can be harmful to company. On the other hand, having excessively flexible rules might lead to blunders and inaccuracies that hurt production. WMS offers several opportunities for reducing expenses. Companies can boost profitability and cut costs with the aid of WMS. Companies may maximise the return on investment by using automated processes to free up the resources and time so that business can concentrate on other crucial areas of the company.

5.0 DISCUSSION

It is essential to understand what to look for when selecting an inexpensive WMS, but it is also crucial to know when to observe an appropriate system. WMS aids in lowering the potential that mistakes will be made when the item is sent. The programme can also assist in timely order fulfilment and continuous monitoring of ordered goods inside the warehouse. Higher precision and fewer problems result from removing the need for duplicate entry of information and items that were lost. It is worthwhile implementing WMS system in an organisation because, with the right WMS, business may receive a tool that not merely enables company to save money but also improves the business throughout its entirety. A study conducted by Miralam and Mohammad (2017) shown all 160 respondents (100%) who use WMS concur that it increases the precision of inventory in the company's warehouses. The physical products and services that a business uses to generate revenue or offer in the market are known as inventory. Since WMS is a computerised system that records all operations in a company's business in order to keep accurate inventory, all responders mentioned that WMS enhances the inventory accuracy. The study supports that WMS improves monitoring and tracking of the item's flow inside the warehouse. Systems for managing warehouses are intended to enhance visibility of inventory, boost efficiency, reduce errors and states, and enhance interaction with customers. It is advised to receive quotes for all of the system services and then make comparison to the expected spending plan for the WMS installation. Most crucially, it is first required to comprehend that WMS costs vary depending on the number of users, products, industry, and particular needs of an organisation. Before its installation, the organisation must internally prepare for an efficient warehouse management system. It will need to be altered in order to make sure it has every feature the business need. It must ensure that every employee properly understands how to utilise the upgraded system. According to the project's size and level of difficulty, different prices will be connected with each of these steps. Setup costs could rise if changes exceed the task's original parameters. It must contain careful analysis and planning on the part of the party that could help to minimise accruing excessive costs. A warehouse control system is affordable for organisations wishing to improve warehouse management processes.

6.0 CONCLUSION

One of the most crucial components of the workflow in distributing groups is the warehouse management system. Process that are optimised can result in significant time and money savings as well as improved productivity. The idea presented in this paper involves employing machine learning techniques to enhance a common warehouse management system by providing users with customised alternatives. The adopted approach streamlines selecting orders, transport, and tracking procedures as well as initial placement of goods and stocks to choosing zone transfer, and order planning. Adding WMS to a corporation could have a range of advantageous effects on the enterprise. WMS could improve inventory management, reduce the generation of waste, and boost efficiency for businesses. Processes are made less complicated and more effective to achieve this. Utilising innovations like artificial intelligence, neural networks, machine learning, and networking is essential as WMS technology continues to advance. This manual acts as a road map, providing helpful advice and best practises to help business navigate the WMS solution market. In the future, researchers should concentrate on studying how companies transport and handle returns on products in order to lower shipping costs, accelerate delivery times, and effectively manage returns. WMS can assist the company in maintaining a competitive advantage in its sector by optimising the shipping and returns procedures.

7.0 LIMITATION OF STUDY

This study's approximate shortage of specific information regarding warehouse management was one of its limitations. Despite efforts to reach the senior management throughout the office interview session, the managers arrived midway for

the scheduled meeting as a result of their hectic schedules. Since the information is confidential, the company in question was unable to provide much statistical data.

8.0 RECOMMENDATION

Warehouses are carefully constructed to suit the unique demands of various industries and product types. This study's conclusions and analysis lead to the following recommendations for addressing identified gaps and propelling warehouse operations towards future progress. Strategies like refining order processing, inventory system checking, and transportation protocols through rigorous evaluation will yield improvements in delivering goods' timeliness and dependability. By streamlining these processes, delays will diminish, and the pace of product delivery will increase overall.

Delivering items from warehouses is essential and prompt delivery may assist businesses to retain more of their consumers. Additionally, it assures the client of dependability, improving their faith in the company. This is essential for converting one-time customers into repeated ones through creating loyalty. Timely delivery of goods is essential for ensuring client happiness. Businesses develop trust and reliability by keeping their delivery promises, ensuring that customers will receive their orders on time.

9.0 REFERENCES

- Abimanyu, Wawan, H. and Erry, R. (2019). Analysis of inventory management using methodology ROP (reorder point) to minimize DOI (days of inventory). *International Journal of Innovative Science and Research Technology*, 4(7), 313-317.
- Cakmak, E., Gunay, N., Aybakan, G. and Tanyas, M., (2012). Determining the Size and Design of Flow Type and U-Type Warehouses. *Procedia - Social and Behavioral Sciences*, 58, 1425-1433.
- Fumi, A., Scarabotti, L., & Schiraldi, M. M. (2013). The effect of slot-code optimization in warehouse order picking. *International Journal of Engineering Business Management*, 5, 20.
- J Liang, Wu,Z., Zhu,C.,& Zhang,Z.H. Table 3: System function test results, 362 *Informatica* 46 (2022) 355-364 , Y. Zhang et al. (2020). An estimation distribution algorithm for wave-picking warehouse management. *Journal of Intelligent Manufacturing*, (1), 1-14.
- Jenkins, A. (2023). Warehouse Automation Explained: Types, Benefits & Best Practices. *Oracle NetSuite*.
- De Koster, R. B., Johnson, A. L., & Roy, D. (2017). Warehouse design and management. *International Journal of Production Research*, 55(21), 6327-6330.
- Kembro, J., & Norrman, A. (2019). Exploring trends, implications and challenges for logistics information systems in omni-channels: Swedish retailers' perception. *International Journal of Retail & Distribution Management*, 47(4), 384-411.
- Khan, S. A. R., Jian, C., Zhang, Y., Golpîra, H., Kumar, A., & Sharif, A. (2019). Environmental, social and economic growth indicators spur logistics performance: from the perspective of South Asian Association for Regional Cooperation countries. *Journal of Cleaner Production*, 214, 1011-1023.
- Miralam, M. (2017). Impact of implementing warehouse management system on auto spare part industry market in Saudi Arabia. *Review of Integrative Business and Economics Research*, 6(3), 56.
- Rashidi, K., & Cullinane, K. (2019). Evaluating the sustainability of national logistics performance using Data Envelopment Analysis. *Transport Policy*, 74, 35-46.
- Saderova, J., Rosova, A., Behunova, A., Behun, M., Sofranko, M., & Khouri, S. (2022). Case study: The simulation modelling of selected activity in a warehouse operation. *Wireless Networks*, 28(1), 431-440.
- Straka, M., Rosová, A., Lenort, R., Besta, P., & Šaderová, J. (2018). Principles of computer simulation design for the needs of improvement of the raw materials combined transport system. *Acta Montanistica Slovaca*, 23(2).
- Li, Y., & Shou, B. (2021). Managing supply risk: Robust procurement strategy for capacity improvement. *Omega*, 102, 102352.

APPENDICES

These interview questions are shown in the following appendices.

- 1) How long have you been involved in shipping and receiving at warehouses?
- 2) What is something that you would like to improve in your company?
- 3) Are you a company that do manufactures and warehousing?
- 4) Can I know how big is the warehouse to store the company goods?
- 5) Is the company goods organized in the warehouse?
- 6) What products and industry do you have experience with?
- 7) After manufacturing, does the goods straight be sent to your warehouse?
- 8) Does your warehouse use any system currently?
- 9) Can I know who manages the vendor and retails relationships?
- 10) What do you feel the most essential part of a warehouse?
- 11) What do you think about WMS?
- 12) Do you think will WMS play an important part in your business to business?
- 13) Would like to implement WMS in the future, for a better inventory system?
- 14) Do you prefer having a small capacity warehouse for your company or choosing a warehousing company to store your goods?