

Impact of Implementing Warehouse Management System on Auto Spare Part Industry Market in Saudi Arabia

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— *Review of* —
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ABSTRACT

The purpose of this research is to find out the impact of implementing warehouse management system on auto spare part warehouses activities in Saudi Arabia market. The researcher has chosen qualitative method to collect valid data for the research, and questionnaires has been conducted to collect the research. The research shows that not all the Saudi companies use WMS, and represents the reasons for not using the system. The research reveals that the WMS provides high satisfaction of service reliability and great improvement in warehouse efficiency and effectiveness in spare part industry market. In addition, the WMS provides a reduction to the overall spare part industry market cost. Finally, the WMS provides a high satisfaction for agility in spare part industry market.

Keywords: Warehouse Management System, Spare part warehouse, Service Reliability, WMS

1. INTRODUCTION

Warehouse are very important nodes in a supply chain network as they perform valuable functions that support the movement of materials, storing goods processing products, de-grouping vehicle loads, creating stock keeping unit collections, and assembling shipments (Langevin & Ripopel, 2005). In this paper, the researcher examines the impact of applying WMS on auto spare part warehouses in Saudi Arabia market. The research is classified to four main parts. First part is literature review where the researcher discussed the importance of auto spare part in Saudi Arabia, the importance of warehouses in the supply chain and the warehouses activities, and warehouse management system (WMS). Second part discusses research methodology and design, where the researcher explained the research method which conducted to collect data and why. At the same time, the researcher clarifying how questionnaire is structured. The third part is about data analyses and discussion. In this part, the researcher analyses the collected data, and represents the percentage of using and not using WMS among Saudi companies, and indicates the reasons for not using the system in Saudi companies. In addition, the researcher discusses the perception of using WMS in warehouse related to efficiency and effectiveness, the perceptions of using WMS in warehouse related to the overall cost, and perceptions of using WMS in warehouse related to system agility. The last part is the research conclusion.

2. LITERATURE REVIEW

2.1 Auto spare part industry in Saudi Arabia

Saudi Arabia is considered the largest importer of automotive products in the Gulf Cooperation Council (GCC). Auto spare part industry grows rapidly in Saudi Arabia, and it is one of the important markets in Saudi Arabia for both new and used vehicle. Imported auto parts from US has grown from \$273.1 million in 2010 to \$355.1 million in 2015. The annual vehicle sales (passenger cars, commercial vehicles and trucks) are estimated to be 900,000 for 2015, which is double the size from 2006. (ITA, 2016).

2.2 Warehouse

The main objective of the supply chain is to provide products to the end customer continuously and in cost-effective way possible. At the same time, a supply chain can add value to the end customer by delivering products in the least amount of time, which means that it could result cutting costs and increasing revenue and customer satisfaction.

Warehouse are very important nodes in a supply chain network as they perform valuable functions that support the movement of materials, storing goods processing products, de-grouping vehicle loads, creating stock keeping unit collections, and assembling shipments (Langevin & Ripopel, 2005). In another word, Warehouse is where the industries store their product and raw materials before delivering them to the customer for production and consumption purpose. The role of warehouse is important as the place to keep products in a safe condition to make sure the environmental element will not affect the product. Warehousing has also been recognized as one of the main operations where companies can provide tailored services for their customers and gain competitive advantage. Frazelle said that warehousing is a component of logistics to bring the key aspect of modern supply chains and plays a critical role in the success or failure of businesses today (Frazelle, 2002). According to Kearney in his study, warehousing contributes to about 20% of logistics costs while the inventory within them adds a further 19%. Therefore, the operations of warehouse are critical to the provision of high customer levels (A.T. Kearney, 2004).

2.3 Importance of Warehouse (Costs in Logistics)

Warehouse is the most important node activity among the components of business supply chain. According to the Survey Analysis investigation by Pyeman & Zakariah study at various companies in Malaysia, 94% of respondents agreed that the warehouse cost is the second cost component in total logistics cost in business (see figure 2.1) (Pyeman&Zakariah, 2013).

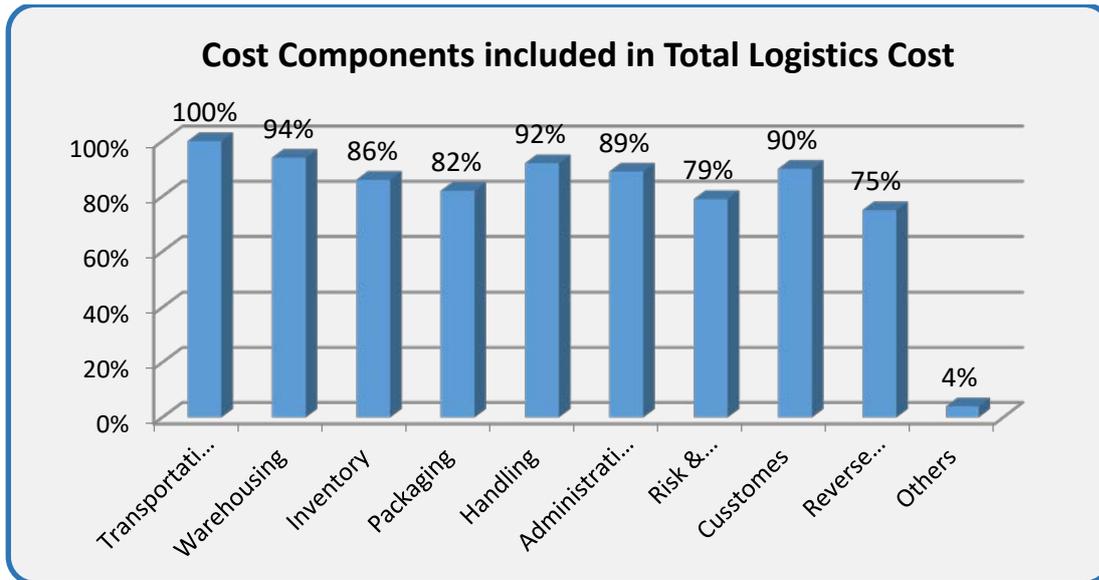


Figure 2.1 - Cost component included in the measurement of total logistics cost

The warehouse cost includes the means of warehouse system, racking structure cost, layout cost, containers, modules, terminals, labors, and time. This figure signifies the cost structure of logistics systems and the importance order in improvement processing. Therefore, warehouse managers must understand warehouse system operation thoroughly. In the result, warehouse affects logistics activities, and it influences production and sale.

2.4 Basic warehouse activities

Frazelle said that there are several activities in warehouse flows. These activities are receiving, transfer and put away, order picking/selection, accumulation/sortation, cross-docking, and shipping (Frazelle, 2002).

- **Receiving operation** - This operation means receiving goods and products from the transport network into the warehouse, the inbound carrier is scheduled to deliver the good at a specific time so as to improve warehouse labor productivity and unloading efficiency.
- **Put-away operation** - This process involving identifying the product, typically scanning the product's barcode, identify location for the items and moving the products and goods to the appropriate location.
- **Order-picking process** - It requires warehouse personnel to select the items ordered by the customer from the storage place or area.
- **Accumulation** - The accumulation/sortation of picked orders into customer orders is a necessary activity if the orders have been picked in batches. In such a case the picked units have to be grouped by customer order, upon completion of the pick process. After picking, orders often have to be packed and stacked on the right unit load (e.g. a pallet).
- **Cross-docking** - is performed when the received products are transferred directly to the shipping docks.

- **Shipping process** - The process concerns with loading goods for shipping to the customer or to the production line. The final movement process occurs at the shipping operation. After outbound carrier arrives at the loading dock, the goods and products are moved to the loading dock from the staging area and into the carrier's vehicle.

Lastly the warehouse information system will update the information reflecting the removal of the goods and products from warehouse inventory and the shipment of products to the customer.

Figure 2.2 represents a WMS capability framework. A capability framework can be developed by categorizing the warehouse functionalities. WMS capabilities required are developing. WMS capabilities start from basic core capabilities which ensure the smooth flow of main warehouse activities to strong core capabilities. (Huang, 2010)

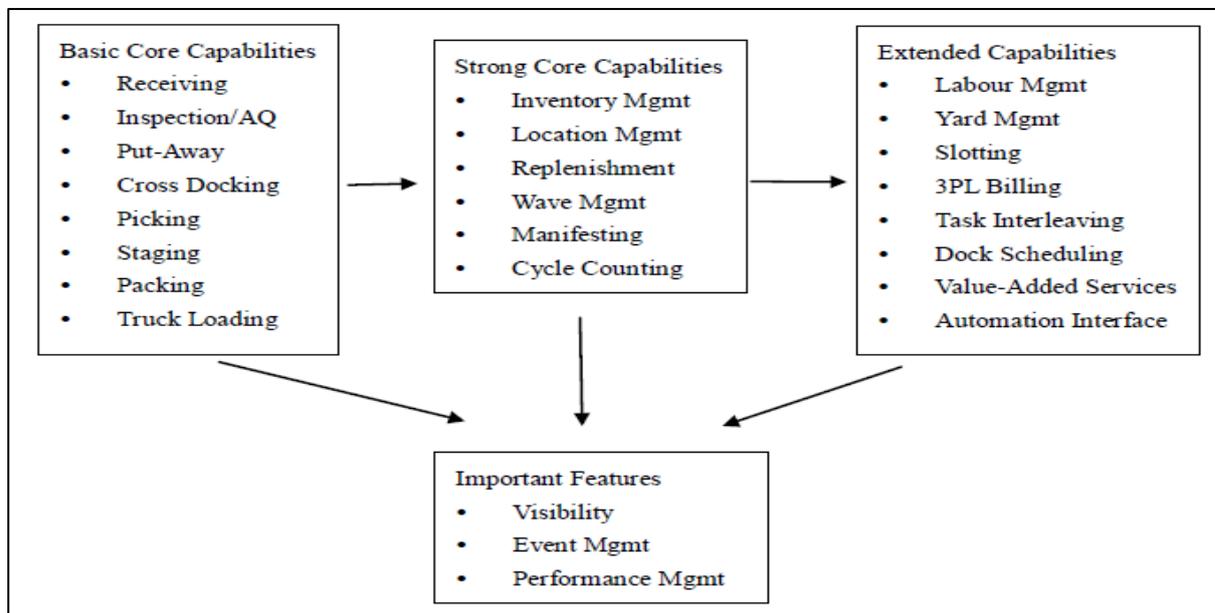


Figure 1.2 - WMS Capability Framework

2.5 Warehouse management system (WMS)

A WMS is an IT database used to improve warehouse efficiency by coordinating warehouse activities and maintain accurate inventory by recording warehouse transaction (Shiau & lee, 2009). Warehouse system plays a vital role in supply chain business. The best warehouse system as Hsieh & Tsai said in their study “a good warehouse system once it ensures easy and efficient access of merchandise, properly use the storage location to find the shortest path, and finally to deliver the merchandise in a reasonable time” (Hsieh & Tsai, 2005). Warehouse systems are used in many environments such as products distribution centers, storage of work-in-process materials (in manufacturing), and testing for the electronic equipment. All warehouse systems share the basic of warehousing function such as receiving, storage, and retrieval of the productions. Even though the philosophies behind these applications are similar, the characteristics for each system could be varied greatly.

Implementation of Warehouse Management System (WMS) will provide an increase in accuracy, reduction in operation costs (paperwork cost, labor & supervision cost), and a greater ability to service the customer by reducing cycle times. WMS will not only lead in inventory reduction but also in greater storage capacity. An increase in accuracy and efficiency of the receiving process might lead to reduction in level of safety stock required. WMS allows warehouses to be quickly and efficiently retrieve products right when they are needed. Using WMS assists organizations to identify the products easily. This will help organization to fulfill a particular order and then direct the workflow needed to fulfill the order in on time, which is called just in time (JIT) (Williams, 2016). Accordind to (Ariff, Ishak& Ismail, 2012) mentioned that the customers will not satisfy if the products or services outcome is below their expectations.

At the same time, implementation of WMS requires significant investment and long period, which should be justified after implementation through the benefits obtained. Moreover, The Company should be prepared to change its entire process and system storage. The implementations of WMS, without changing processes, has proved that it does not lead to cost savings or efficiency improvements, as it will only reduce errors due to human factors (Poon, Choy, Chow, Lau, & Chan, 2009).

3. RESEARCH METHODOLOGY AND DESIGN

The purpose of this research is to find out the impact of implementing warehouse management system on auto spare part warehouses activities in Saudi Arabia market. The researcher has chosen qualitative method to collect valid data for the research because of the following reasons:

Qualitative method generates data about human groups in social settings. Also, it gives a deep understanding of a specific organization through first-hand experience, truthful reporting, and quotations of actual conversations, rather than surface description of a large sample of a population. In addition, Qualitative method lets the meaning emerge from the participants, and it is more flexible for adjusting the way that collecting and analyzing the data as the research progresses.

Finally, qualitative research uses observation as the data collection method. Observation is the selection and recording of behaviors of people in their environment, and it is useful for generating in-depth descriptions of organizations or events. Observation helps to obtain information that is otherwise inaccessible, and for conducting research when other methods are inadequate (Neuman, 2000).

The researcher has collected the research data by conducting questionnaires. A questionnaire is a research instrument consisted by some series of questions for the purposes to gathering information from the respondent. A questionnaire has been chosen because of the following reasons: it is a Practical and economical method, and it can collect large amounts of information from a large number of people in a short period of time. In addition, it has limited affect to its validity and reliability even if the questionnaire is carried out by the researcher or by any number of people. Additionally, the result can be quickly and easily quantified by either a researcher or through the use of a software package. Also, collected quantified data can be used to compare and contrast other

research and may be used to measure change. Furthermore, it is believed that quantitative data can be used to create new theories and / or test existing hypotheses. Finally, collect data can be analyzed more 'scientifically' and objectively than other forms of research (K. Popper, 1959). a questionnaire uses both open and closed end questions to collect data. Closed end questions are structure questions that can e answered by allowing only answers fit into categories that have been decided in advanced by the researcher. The research has chosen Closed end questions in the questionnaire because data can be collected quickly and easy as closed questions (usually just ticking a box). Also, the research has chosen Closed end questions because the questions are standardized. All respondents are asked exactly the same questions in the same order. This means a questionnaire can be replicated easily to check for reliability. But, because the lack of detail and, the responses are fixed to supply their answers, the researcher has added open ended questions in the questionnaire (Smith, 1992).

According to Trochim, Sampling is the process of selecting units from a population of interest so that by studying the sample we may fairly generalize our results back to the population (Trochim, 2006), that is why, a questionnaire has been distributed to a number of supply chain managers, warehouse managers and selling manager in auto spare part Industry. In the result, the survey was distributed to a total of 300 people who are based in Jeddah and Riyadh.

The questionnaire was printed out in written question by the researcher intends to retrieves statistical and description data. The interviewee has been contacted through emails followed by phone to speed up the data collection process, provide immediate response for ambiguity (if any), and therefore ensure getting accurate results. The researcher received back 285 out of 300 questionnaires, 15 of them could not be collected.

The questionnaire has been set in both open and closed end questions (see appendix) into two Part I (General information) and Part II, where there were different questions for each part.

Part I is general information about the interviewee such as company name to indicate the industry type, the interviewee name (optional), and the interviewee position to make sure that the questionnaire is giving to the right person.

Part II is about WMS implementation, and it is divided to two section. First section is to know if the company uses the WMS or not, ant what is the reason for not using the system. The researcher suggests that two reasons for not using the system as the literature mentioned (Poon, Choy, Chow, Lau, & Chan, 2009).

- 1) High Implementation Cost
Or/and
- 2) Changes in process and procedures

At the same time, the researcher gives the opportunity to the interviewee to say other reasons if there is any.

Second section is that if the company uses the system. First question in the second section is what the interviewee perception of using WMS in warehouse related to efficiency and

effectiveness are in many areas such as inventory accuracy, inventory location and order picking process, space utilization in the warehouse, and customer satisfaction, as mentioned in the literature.

Second question is that what The interviewee perceptions of using WMS in warehouse related to the overall cost are from many different point of views such as implementation cost, labor and supervision cost, return on investment and paperwork cost as mentioned in the literature.

Third question is about what the interviewee perceptions of using WMS in warehouse related to system agility are from many different point of views such as shipment accuracy, shipment detecting and tracking efficiently, and speed for material handling as mentioned in the literature.

4. DATA ANALYSIS AND DISCUSSION

4.1 Using of WMS

In this section, the researcher represents the percentage of using and not using WMS among Saudi companies, and indicates the reasons for not using the system in Saudi companies. The research showed that 56% (160 companies out of 285) of the selected companies have been using a WMS, while 44% of them (125 out of 285) have not been using the system (See figure 4.1).

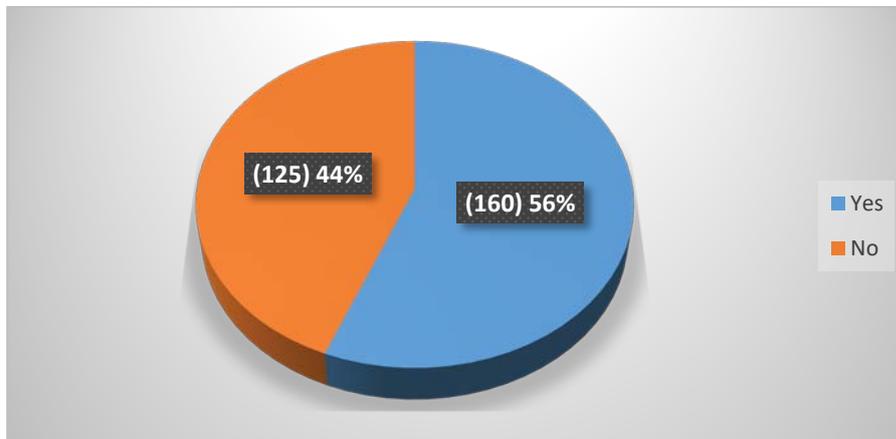


Figure 4.1- Using of WMS

Figure 4.2 shows the reasons for not using WMS. The researcher found that 35 companies out of 125 (28%) do not use WMS because they do not want to apply changes in process and procedures, while 25 companies out of 125 (20%) do not use the system because implementing such system has high cost. The researcher found there is a relationship between these two causes. Sometimes the relationship comes from that applying WMS need a lot of changes which should be done to ease implementing the system such as adding or remove some equipment or changing work procedures, which is extra cost. Additionally, the high cost could come from the system requirements and needs, such as

employees training or hiring expert users to deal with system who take higher salary than other users. The study reveals that there are many other reasons that may affect using WMS in Saudi Arabia. The study found that 30 companies out of 125 (24%) do not apply WMS because of lack of awareness of the system, as shown in Figure 4. This reflect that the advantages of using WMS are still not clear to most of Saudi Arabian companies either because the lack of employees'/ managers' expert in the field or their afraid from using a new technology. Additionally, the study found that 19 companies out of 125 (15%) warehouse managers prefer to do their job manually instead of using WMS. These mangers do that to force higher management to depend on them for doing the work, and they can't fire them. At the same time, sometimes the mangers like to do works as they know and familiar with, and they do not want to apply any changes or improvement. This represent the week way that are used to choose employees by companies in Saudi Arabia. That is why although some companies apply WMS, their managers do not use full functions of the WMS. They use it only for basic works such as receive, put away, store, count, pick. These managers act this because they do not want also the higher management or companies' owners dispense them. This represents why higher management or companies' owners do not follow their managers how they are doing works, they only put and invest money without observation, and leave the following for others. Furthermore, the study found that 16 companies out of 125 (13%) do not trust vendor who is selling them the WMS product. These vendors don't provide a good maintenance to the system, and they do not pay attention to companies after selling the product. So, companies prefer to keep working manually or using the old system instead of losing money in new system. It is important to say that there are good vendors in the market, but they are few, and most of them fail to prove a history of success.

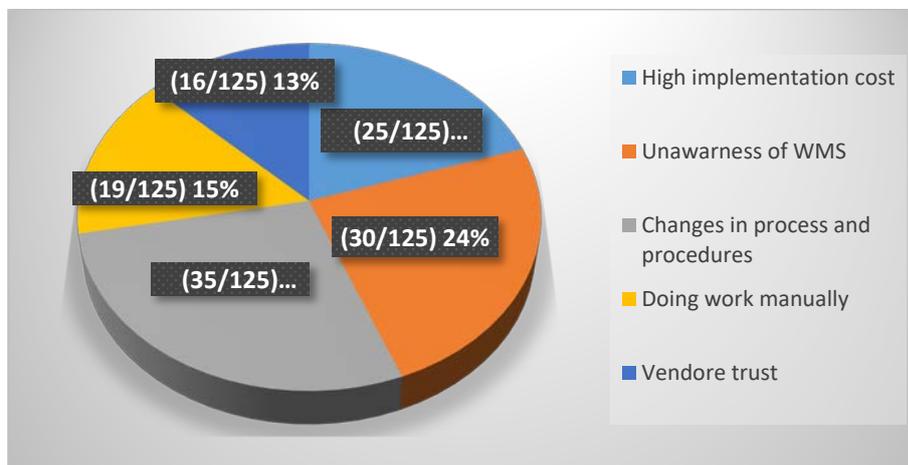


Figure 4.2 - Reasons for not using WMS

Finally, the researcher found there are other reasons than what are stated by Poon, Choy, Chow, Lau, and Chan in the literature for not using WMS, (High Implementation Cost or/and Changes in process and procedures) (Poon, Choy, Chow, Lau, and Chan, 2009). The other reasons are lack of awareness of the system, managers' preference to do work manually and lack of vendor trust.

4.2 The perceptions of using WMS in warehouse related to efficiency & Effectiveness

In figure 4.3, the research shows that 160 of the respondents (100%) (who are using the WMS) agree that the WMS improves the inventory accuracy in the company's warehouses (see figure 4.4). Inventory is known as the physical products or services that a company sell or use to provide in the market. All respondents mention in the questioner that the WMS improves the inventory accuracy because WMS is an electronic system that records all activities in a company business to maintain accurate inventory. At the same time, the study found the WMS increases monitoring and tracking the flow of the products inside the warehouse.

Additionally, figure 4.3 shows that 90 of the interviewee (56%) believe that WMS helps to improve the inventory location and order picking process, while there is 44% does not feel that WMS helps to improve the inventory location and order picking process (neutral) (see figure 4.5). (56%) of the interviewees mentioned that WMS assists them in the process of clustering and scheduling the customer orders, assigning stock on the right locations, releasing orders and picking orders from the storage. 44% does not feel that (neutral) because their company are small size and they prefer to do all these process manually or they are using the WMS partially.

In addition, figure 4.3 shows that 96 of the respondents (60%) agreed that the WMS helps to improve the space utilization in the warehouse, while 64 (40%) are neutral (see figure 4.6). This is because (60%) of the respondents mentioned that WMS helps them to track the flow of the product closely (product activity and unit load dimensions) to make sure that non used product is not occupying valuable space in the warehouse. (40%) of the interviewees are neutral because they represent small size companies and they prefer to do all these process manually or they are using the WMS partially.

Additionally, the WMS helps to enhance customer satisfaction while the other (14%) are neutral (see figure 4.7). The study found (86%) of the interviewees agree that the WMS helps to enhance customer satisfaction because by using WMS companies can sale products without missed deliveries, short ships, or shipping errors, thereby customer satisfaction will be increased. At the same time, WMS can automatically recognize any error or mistake, and it can be corrected quickly. (14%) from the respondents are neutral because they are using the WMS partially, and they do not take the advantages from the system.

Finally, the researcher concludes that the WMS provides a high satisfaction of service reliability and great improvement in warehouse efficiency and effectiveness in spare part industry market.

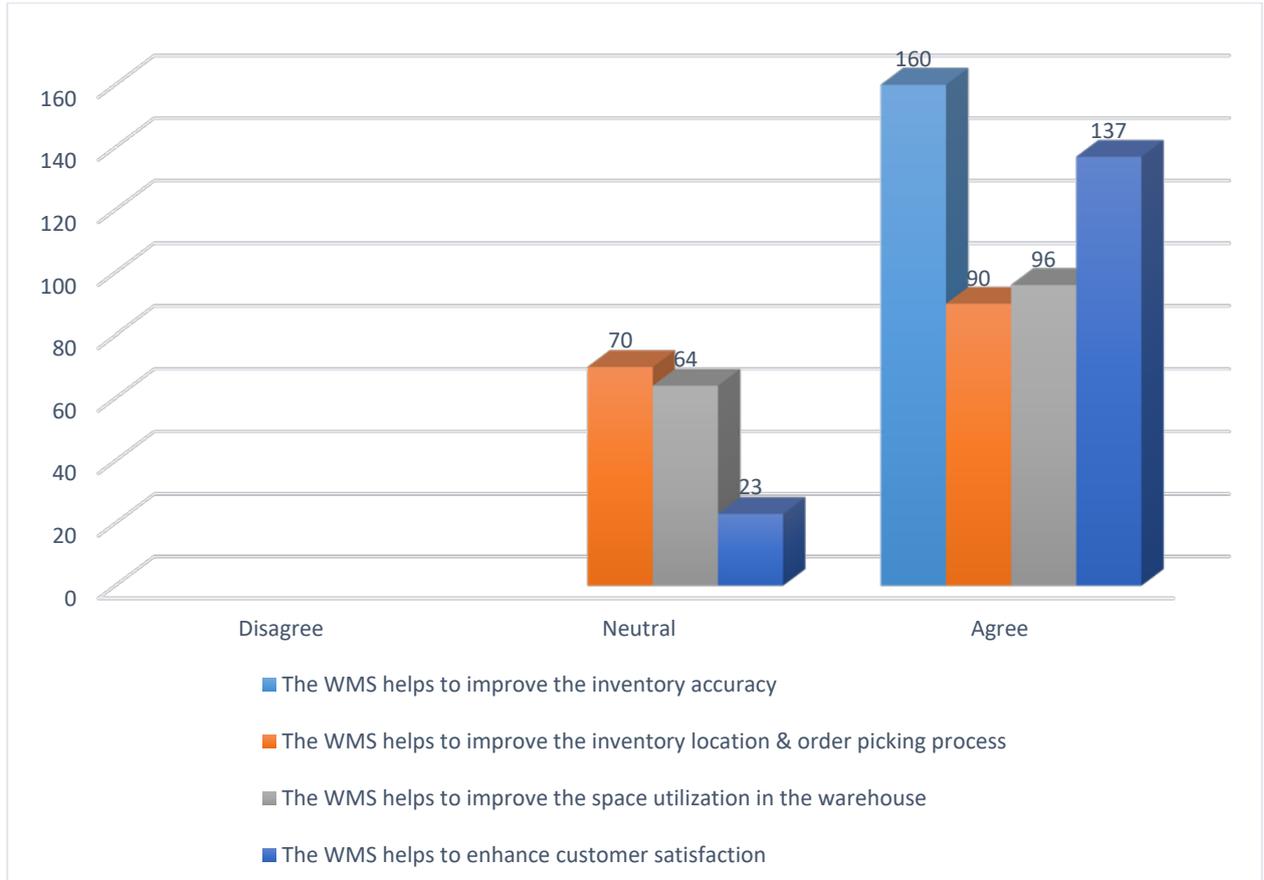


Figure 4.3- The perceptions of using WMS in warehouse related to efficiency & Effectiveness

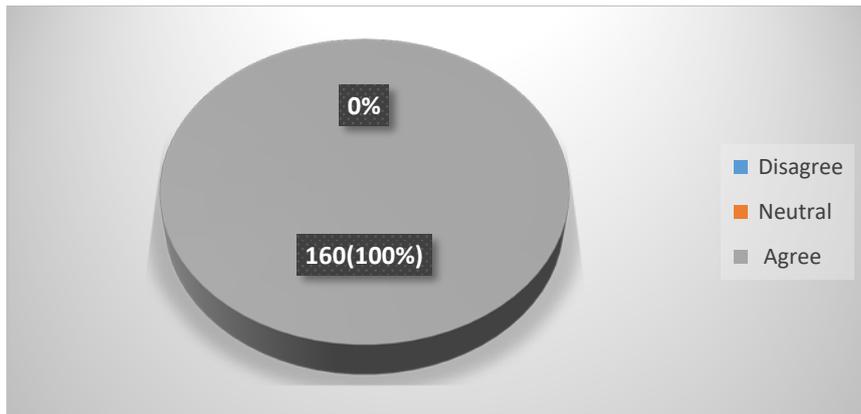


Figure 4.4- The WMS helps to improve the inventory accuracy

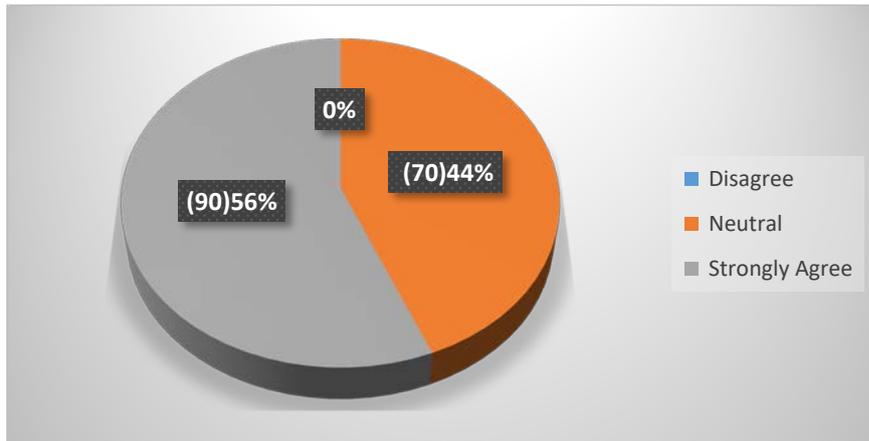


Figure 4.5- The WMS helps to improve the inventory location & order picking process

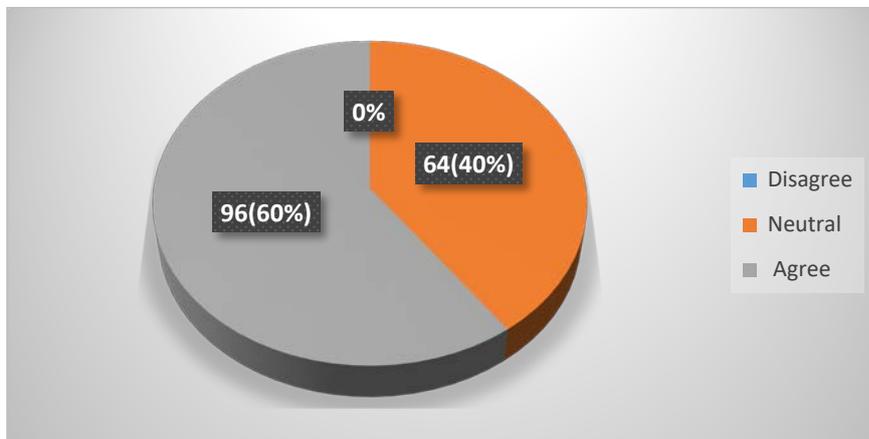


Figure 4.6- The WMS helps to improve the space utilization in the warehouse

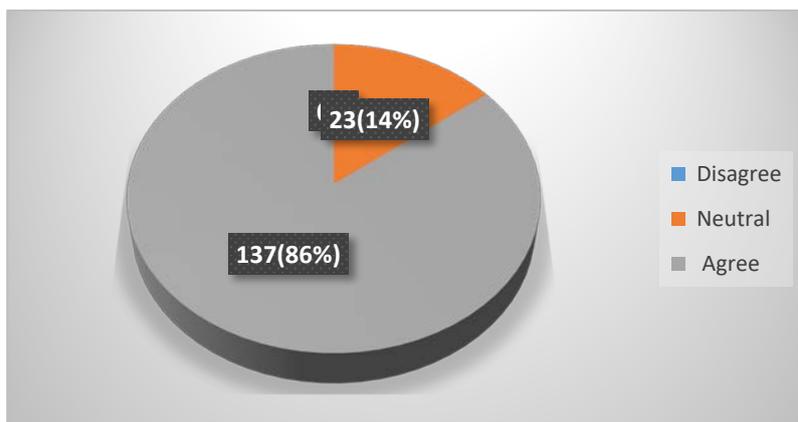


Figure 4.7- The WMS helps to enhance customer satisfaction

4.3 The perceptions of using WMS in warehouse related to the overall cost

As shown below in figure 4.8, it is found that 160 of the respondents (100%) agreed that WMS helps to reduce labor & supervision cost (see figure 4.9). Using WMS can reduce the labors salary because of minimizing the time of work per hour such as reducing in overtime cost and training costs or because of cancelation of some work positions which can be handled by the system such as monitoring clerk position. Furthermore, WMS assists companies to measure workers’ productivity to use it distribution work among employees

In addition, 160 of the interviewees (100%) agree that the WMS has high return on investment (see figure12). If the system is used fully functionally it means that there is a big change in overall business performance, reduction in overall operational costs. and optimizing tasks. All these advantages encourage companies to invest on WMS.

Moreover, 100% of the respondents agree that WMS helps to reduce paperwork cost through computerization (see figure13). WMS uses barcode scanners, mobile computers, Radio-frequency identification (RFID) to monitor the flow of products and to issue all needed reports, lists and orders electronically as the interviewees mentioned.

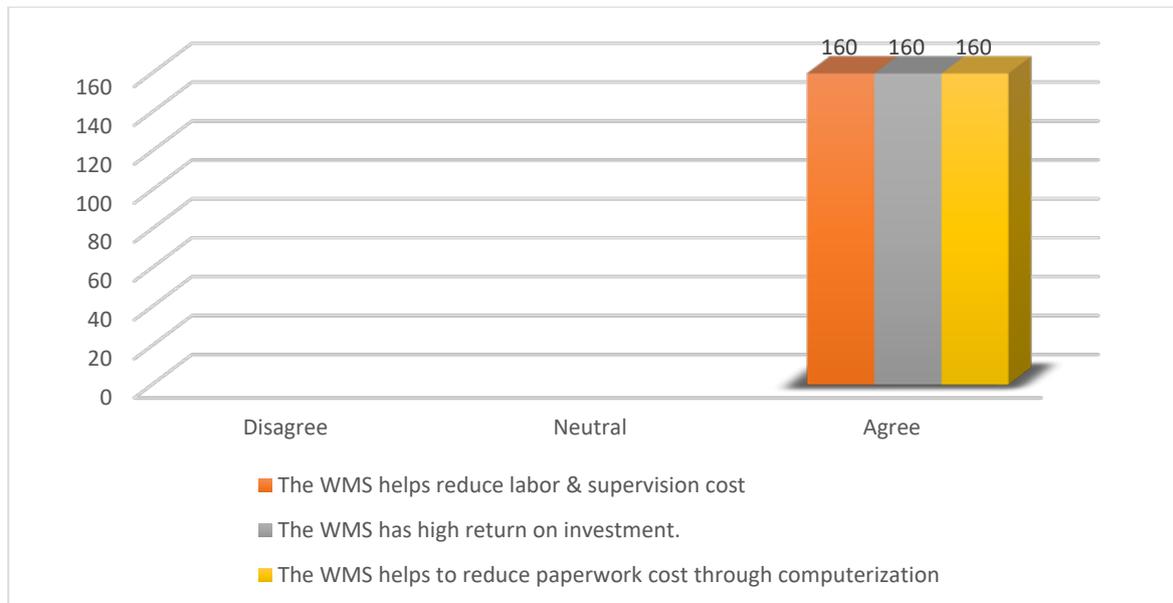


Figure 4.8 - The perceptions of using WMS in warehouse related to the overall cost

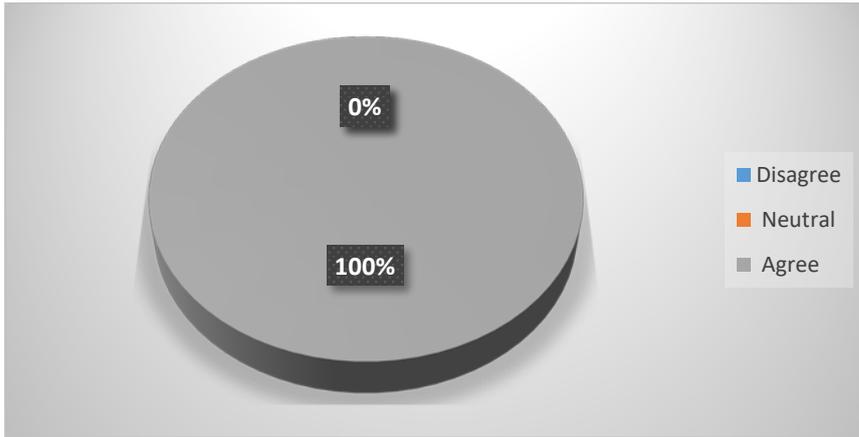


Figure 4.9 - The WMS helps reduce labor and supervision cost

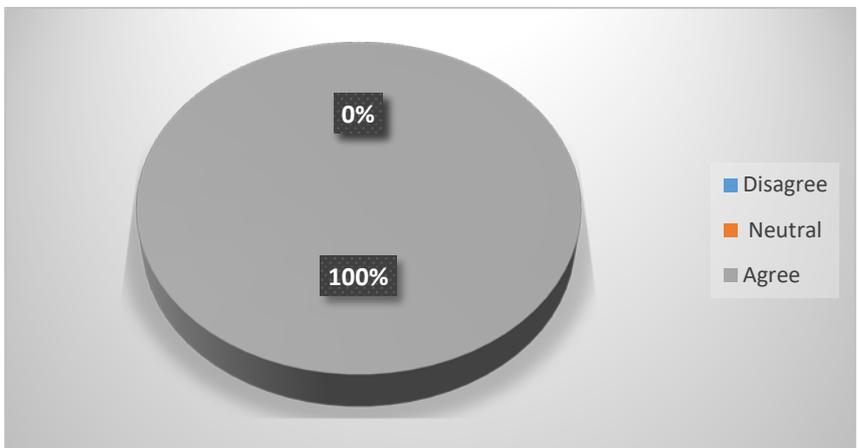


Figure 4.10- The WMS has high return on investment.

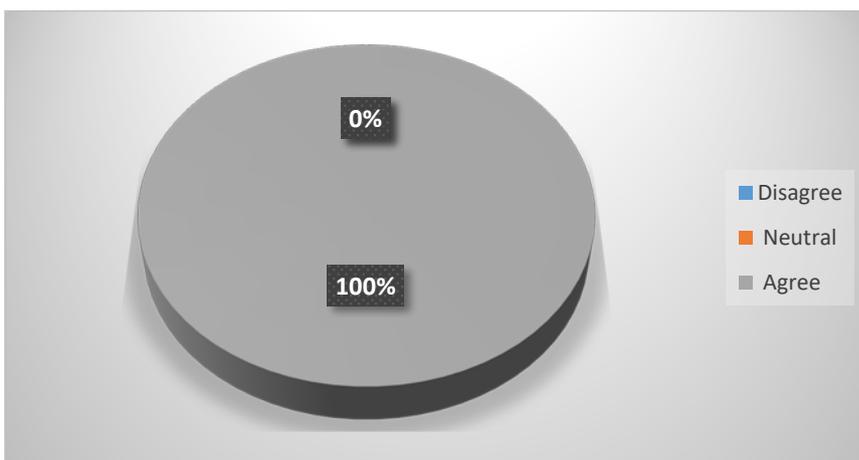


Figure 4.11 - The WMS helps to reduce paperwork cost through computerization

4.4 The perceptions of using WMS in warehouse related to system agility

Figure 4.12 shows that 160 of the respondents (100%) agree that WMS helps to increase shipment accuracy (see figure 4.13). The researcher found that WMS helps companies to visible and monitor products inside the warehouse along with an order and shipment accuracy because the system assists companies to view the movement of their inventory and ascertain the accuracy of the shipments. WMS assists company to improve the end-to-end process by ensuring to complete and manage the work in a specified timeframe and needed accuracy. These companies believe WMS allows businesses to utilize their employees' talent knowledge and expertise to make the business bigger and better.

Also, it is found that of the respondents (100%) agree that WMS helps to detect and track the goods efficiently (see figure 4.14). The interviewees represent that WMS can record and store all warehouse activities electronically. This allows companies to follow up the flow of the products to ensure that there are no any problems with it to prevent shortages, save enough space for products storing and well distributed inside the warehouse. At the same time WMS assists companies to follow up their customer's information, and make sure that they meet all their expectations.

In addition, the research represents that 105 of interviewees (66%) agree that the WMS helps to increase speed for material handling while 25 (15%) are neutral and 30 of the interviewees (19%) disagree (see figure 4.15). The study represents that (66%) of respondents mentioned that WMS increase the company's ability to handle material by allowing warehouse's workers become more efficient with fewer steps, and the employees can reach to product positions in direct way and quickly. At the same time, (15%) of the interviewees are neutral because they are using the WMS partially or they use only the basic functions of the system. In the other hand, (19%) disagree that WMS increases the speed of material handling because the researcher found that the workers inside the warehouse do not get a good training on the system to use it.

Finally, the researcher concludes that the WMS provides a high satisfaction for agility in spare part industry market.

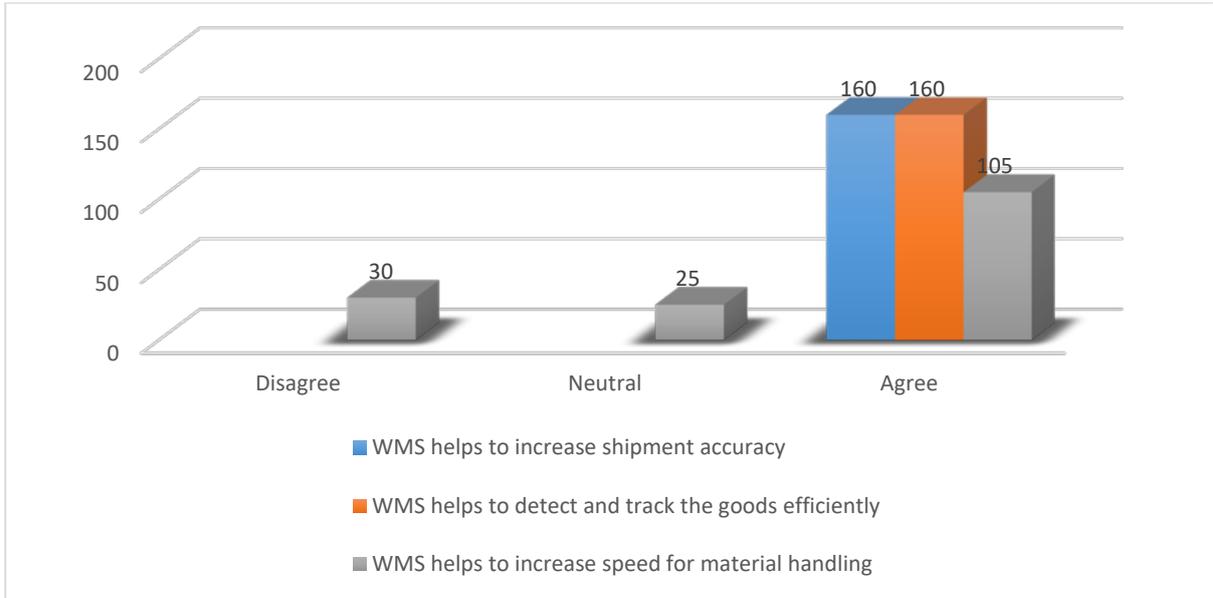


Figure 4.12 - The perceptions of using WMS in warehouse related to system agility

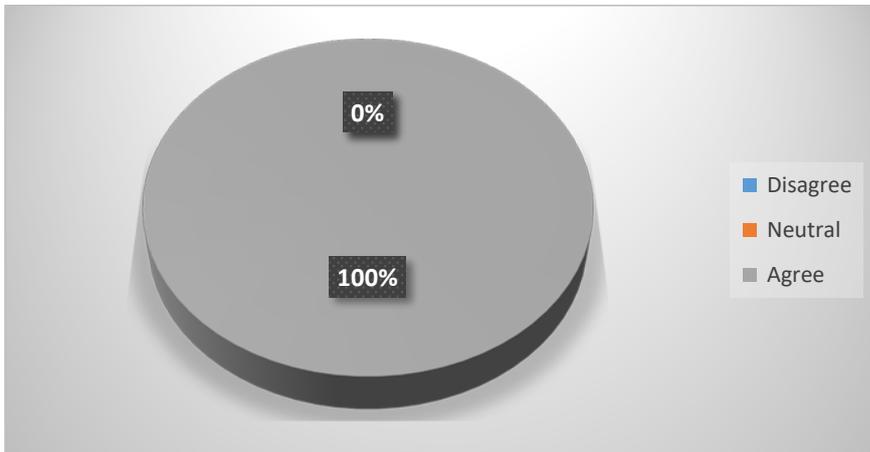


Figure 4.13 - WMS helps to increase shipment accuracy

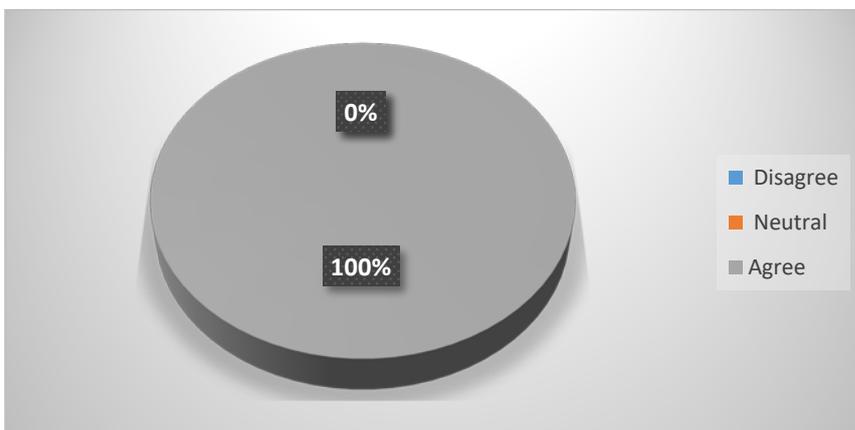


Figure 4.14 - WMS helps to detect and track the goods efficiently

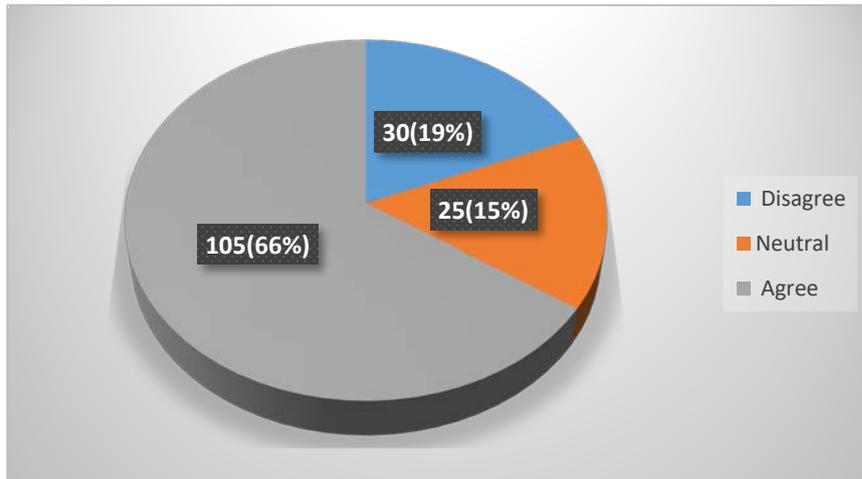


Figure 4.15 - WMS helps to increase speed for material handling

5. CONCLUSIONS

The researcher found WMS is used by the most of Saudi Arabian companies in auto spare part industry in Saudi market. The study shows that 56% of companies is using WMS, and 44% of them is not (See figure 3).

The study found that there are some reasons for not using WMS. Two of them are mentioned in literature. The first reason is (28%) of interviewed companies (35 companies out of 125) do not want to apply changes in process and procedures. The second reason is (20%) of companies (25 companies out of 125) they do not use the system because implementing such system has high cost (Poon, Choy, Chow, Lau, and Chan, 2009).

The other reasons are mentioned by the interviewees, and they have not been mentioned in the literature. These reasons are as the following: the first reason is that a lack of awareness of the system as mentioned by (24%) (30 companies out of 125). The second reason is that warehouse managers prefer to do their job manually instead of using WMS as mentioned by (15%) (19 companies out of 125). The third reason for WMS is not used by companies as interviewees represented companies do not trust vendor who is selling them the WMS product as (13%) (16 companies out of 125) mentioned (see figure 4).

The research reveals that 160 of the respondents (100%) (who are using the WMS) agree that the WMS improves the inventory accuracy in the company's warehouses because WMS is an electronic system which allows to WMS increase monitoring and tracking the flow of the products inside the warehouse (see figure 4.4).

Also, 90 of the interviewee (56%) believe that WMS helps to improve the inventory location and order picking process because that WMS assists to cluster and schedule the customer orders, while there is 44% (neutral) does not feel that WMS helps to improve the inventory location and order picking process because their company are small size and

they prefer to do all these processes manually or they are using the WMS partially (see figure 4.5).

In addition, 96 of the respondents (60%) agreed that the WMS helps to improve the space utilization in the warehouse, because the system makes a good planning for the product to be occupied inside the inventory. while 64 (40%) are neutral because they represent small size companies and they prefer to do all these processes manually or they are using the WMS partially (see figure 4.6).

additionally, (86%) of the respondents agree that the WMS helps to enhance customer satisfaction because of sending product to right location with sort time without errors, while (14%) are neutral because they are using the WMS partially, and they do not take the advantages from the system (see figure 4.7).

Furthermore, it is found that 160 of the respondents (100%) agreed that WMS helps to reduce labor & supervision cost because of minimizing the time of work per hour and reducing in overtime cost and training costs or because of cancelation of some work positions (see figure 4.9)

In addition, 160 of the interviewees (100%) agree that the WMS has high return on investment when the system is used in fully functionally which makes a big change in overall business performance, reduction in overall operational costs. and optimizing tasks see figure 4.10).

Moreover, 100% of the respondents agree that WMS helps to reduce paperwork cost through computerization because of using barcode scanners, mobile computers, Radio-frequency identification (RFID) and others (see figure 4.11).

Additionally, 160 of the respondents (100%) agree that WMS helps to increase shipment accuracy because of increasing in visibility and monitoring of products inside the warehouse (see figure 4.13).

Also, it is found that (100%) of the respondents agree that WMS helps to detect and track the goods efficiently because all operation and activities can be recorded electronically which allows companies to follow up the flow of the products from the begging up to end customer (see figure 4.14).

In addition, the research represents that 105 of interviewees (66%) agree that the WMS helps to increase speed for material handling because the WMS allows the employees to reach the product positions in direct way and quickly while 25 (15%) are neutral because companies are using the WMS partially or they use only the basic functions only. In the other hand, (19%) disagree that WMS increases the speed of material handling because the researcher found that the workers inside the warehouse do not get a good training on the system to use it (see figure 4.15).

REFERENCES

- [1] A.T. Kearney. (2004). *Excellence in Logistics* . Brussels: ELA .

- [2] Frazelle, E. (2002). *World-class warehousing and material handling*. New York: McGraw-Hill.
- [3] Hsieh, L.-f., & Tsai, L. (2005). "The optimum design of a warehouse system on order picking efficiency". *The International Journal of Advanced Manufacturing Technology*, 626-637.
- [4] ITA (2016) Top Markets Report Automotive Parts. Retrieved 9,20,2016
- [5] http://trade.gov/topmarkets/pdf/Autoparts_Saudi_Arabia.pdf
- [6] Langevin, A., & Ripopel, D. (2005). *Logistics Systems: Design and Optimization*. New York: Springer.
- [7] Mohd Shoki. Bin Md.Ariff, Hiew Sok Fen Norhayati Zakuan Nawawi, Khalid Ismail. (2012). "Relationship Between Customers' Perceived Values, Satisfaction and Loyalty of Mobile Phone Users". *Review of Integrative Business & Economics Research*. Vol 1(1).
- [8] Neuman W L (2000) Social research methods – Qualitative and quantitative approaches, Allyn and Bacon Pub (4th ed)
- [9] Poon, T., Choy, K., Chow, H. K., Lau, C. H., & Chan, T. F. (2009). "A RFID case-based logistics resource management system for managing order-picking operations in warehouses". *Expert Systems with Applications*, 8277-8301.
- [10] Popper, K. (1959), *The Logic of Scientific Discovery* reprinted (2004) by Routledge, Taylor & Francis
- [11] Pyeman & Zakariah. (2013). "Logistics Cost Accounting and Management in Malaysia:Current State and Challenge". *International Journal of Trade*, 120-121.
- [12] Shiau, J. Y., & Lee, M. C. (2009). "A warehouse management system with sequential picking for multi-container deliveries". *Computers and Industrial Engineering*, 382-392.
- [13] Smith, C. P. (Ed.). (1992). *Motivation and personality: Handbook of thematic content analysis*. Cambridge University Press.
- [14] Trochim, W. M. (2006). *Sampling*. Retrieved 4 20, 2015, from Knowledge Base: www.socialresearchmethods.net
- [15] Williams, D (2016). "Driving-just-in-time-order-fulfillment-with-a-warehouse-execution system". Retrieved 7,20,2016:
- [16] <http://www.sdexec.com/article/12157853/driving-just-in-time-order-fulfillment-with-a-warehouse-execution-system>Driving Just-in-Time Order Fulfillment with a Warehouse Execution System