



## Study of warehousing information technology practices and their impact on the performance

Yaqub Saif Al-Tamtami  
*Student, Middle East College  
Muscat, Oman*

Dr. Prakash Kumar Udupi  
*Faculty, Middle East College  
Muscat, Oman*

### 1. Abstract

The warehouse department of any company is considered one of the essential departments for it because it is regarded as the department that communicates with the companies that supply the materials and tools for the company. One of the crucial things that the department must pay attention to is efficiency because it must be available to employees who work in warehouses. In contrast, this study focused on warehousing information technology practices and their impact on performance of organizations. The study aimed to evaluate the effectiveness of the information technology system in the warehouse. Also, one of the methods used by the researcher to obtain information and data, in terms of primary sources, is to interview the warehouse manager and distribute the questionnaire to 69 employees. This purpose is to verify the effectiveness of warehouse IT practices. As for secondary sources, both magazines, books, and the Internet were used to obtain sufficient information and data that were relevant to the researcher's topic.

### 2. Introduction

The industries and services related to the logistics sector in Oman are one of the most important businesses, with the aim of raising the level and efficiency of the Omani economy. Charts and estimates show that the logistical sector has a contribution of more than about \$

10 billion per year for the year 2020, while in 2022 the contribution will increase by about 7%. [10]. Logistics sector is the primary sector that tries both in improving profits and in the production of all investments in Oman. On the other hand, the Sultanate of Oman has a clear and considered view of investing in the environment for the infrastructure of the logistics sector, upon reaching the year 2040. On the other hand, what makes Oman fly is the expansion of all infrastructure and all logistical specialties such as seaports, land roads and industrial cities. Also, when the level of expansion is raised in the free zones, this makes the Sultanate of Oman the capacity to absorb in terms of jobs and large businesses.

IT is the tool that is used in both computers, storage, networks and all matters related to construction, insurance, and electronic exchanges. Most of the time, information technology is used in all businesses related to the organization to accomplish it in a short time. Also, the use that is made in information technology is in two forms, one of which is computer technology and the other is telephony [13].

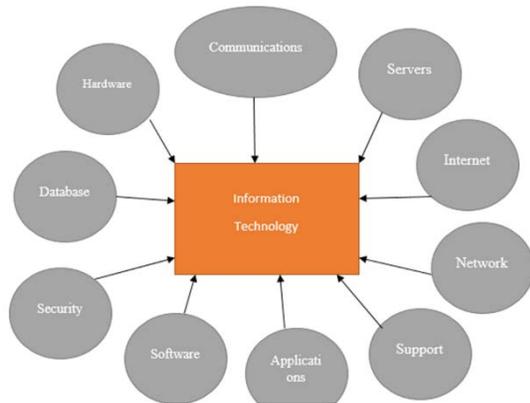


Figure 1: What is information technology [3]

WMS is the program through which companies and organizations are allowed to control mechanisms of all warehouse operations, managing them by entering the warehouse until they are excited again. The processes that are in the warehouse management system include many, among them the audit and selection processes. In contrast, warehouse management systems come in the form of a variety of how to implement them. Most of the time, the type depends on the size and nature of the organization. It can be in the form of systems and units in the ERP system or in the supply chain. Although (WMS) is expensive and complicated, it does gain the institution many benefits that make you justify this high cost. Among these benefits, it helps the organization reduce workers' costs, improve inventory accuracy and reduces incoming errors and improvements in customer service provided [8]



Figure 2: Warehouse Management Systems [11].

**A. Problem Statement**

Most companies have many problems through which managers work to study the issue and find solutions to be avoided in the future. Regarding the problem, the research will explain the effect that occurs on the employee's performance when using information

technology with pure efficiency in the warehouse is. When an employee works on less efficient information technology, this will make the employee not able to keep pace with the changes that are taking place in technology today. But when modern high-speed information technology systems are used, it will raise skills and competencies among warehouse workers and finish the works in a short time without any significant errors. Many times, some of the companies and institutions that face some of the problems in the warehousing information technology practices and their impact on the performance for the employees of the institution. Many methods can thwart the storage practices process. Some of the problems that any organization may face are knowledge of the critical requirements, whether for the worker or the administration as a whole, and the most appropriate exploitation mechanism for it. One of the essential points that lead to loss and failure is not reaching the required number of points in achieving the planned large values in storage practices. On the other hand, is the lack of that ability of organizations to choose the most appropriate way in warehousing information technology practices among employees, so companies and institutions will lose a lot of things, including time, money and effort, for the development of storage practices and their impact on performance among employees.

**3. Literature Review**

Chen and Huang researched warehouse operations which were supported by IT systems and identified the indicators in the industry. Logistics division is considered an important part of companies and huge investment is made to reduce the time gap from inventory to display center. Most of the countries have changed the warehouse system as it has improved the business performance of companies and created additional revenue. The study also stated that many IT models have been combining with theory to get better results but each of the methods lagged some part of development. The main aim of the research was to analyze the result for industries and design an extensive system for logistics [4]. The research used a case study for identifying KPI for logistics. It helped to focus on processes and functions related to warehouse management. The area of cost and security was also highlighted as the key parameter for the companies' warehouse. It would help to add benefits for inventory and storage space.

Some of the vital resources which are considered in managing a warehouse are human capital as well as material handling. Information technology can also be incorporated into this area. Ramli and Bakar carried out research to link vital resources with warehouse

operations. It was stated in the paper that very little research has been carried out in this area and study would aid to provide a better perspective for warehouse operations. The study used a quantitative set of methodology and questionnaires were asked from 1589 warehouses regarding ICT and material handling. The selection of warehouse was based on Malaysian origin. It was found from the research that warehouse operations had a significant relationship present with vital resources. The study also stated that human capital remains the main priority for a warehouse to achieve higher performance. The paper carried out original research to the area of warehouse operations. The methodology and results help to understand that warehouse management can be carried out with vital resources [9].

Quality management and supply chain methods are important concepts that should be focused on the case of warehouse operations and performance. Basheer and Siam researched quality and supply chain management methods and linked them with the use of ICT. The study stated that information technology also tries to narrow the gap present between inventory and management practices. The study was carried on Textile companies and one of the objectives of the research was to focus on smart warehouse management. The results of the study showed that all the assumptions were relevant to the management principles and concepts. Information technology has proven as a mediator for quality and supply chain. The results of the study can be used for policymakers as well as managers of the organization because the warehouse of a company plays the main foundation concerning performance and daily business operation. The research paper provided a unique recommendation for technology and supply chain. It can be used as a guide for warehouse operations and the results can be reproduced for better performance. The selection was also a good choice for the research subject [2].

#### **4. Methodology**

Qualitative analysis approach is used to gather the problems faced by the targeted user and information related to their point of view and opinion regarding that intended hypothesis. [6]. Quantitative research is based upon the outcome of the qualitative results, which is used in this study after qualitative analysis [5]. The approved sample is 70 persons out of the total number of the company's 700 employees. The warehouse department is the place that is linked to all the departments in the company, and who do to finance all the supplies that these departments need in terms of consumption and operation. It is possible to consider all the employees of the company among those targeted by the researcher. It is

not easy to research 700 employees in terms of time and resources available to the researcher. On the other hand, the researcher has decided to take a sample of the employees, about 69 employees out of the total number of employees in the company. Finally, to take all the factors with high accuracy, the researcher decided to choose this category to achieve the specific goals related to the research.

Through the initial survey, it may help the researcher to determine the main targets of this research and all races within this company. A category of the primary objectives has been identified through the accuracy of the information that they must provide with the research and the main people, which may provide the researcher with the primary information and data for the research points. It included the category of key informants who have a great deal of knowledge and an excellent understanding of the company's operational and operational procedures and some leaders and heads of departments who can provide a comprehensive view of the researcher. The other informants are the forces that have those skills for all operational tasks, and they also have that knowledge to face both problems, challenges, and developments at the executive level. It is known as sampling technology as that technique or process that is used in statistical analyzes by taking some samples from the population [12].

On the other hand, through this study, the researcher will decide on the selection of non-probability samples as one of the useful methods of sampling and has that application for both qualitative and quantitative studies. On the other hand, non-probabilistic examples are the process by which samples are collected in a process, and not all participants are given equal proportions or opportunities for inclusion. This is because it is one of the cheap and can be done quickly. As for when the matter is close to the researcher, it is one of the conditions that will facilitate the arrival and testing of the appropriate samples at a specific and specific time.

The application of sampling is considered one of the most severe and appropriate things, contrary to the methods of sampling, and it is possible to be able to collect data and information in a short period. Also, the target group is of a homogeneous and coherent category and sample, so there will be no problem available for the research findings that were found through random samples. On the other hand, the ability of a generalization is defined as ensuring that the acquired method is to represent the group of the population from which the sample is extracted. Although the rest sample is indicative because it is biased but not particularly intimidating.



Figure 3: Qualitative Research Design 2019 – Definition & Techniques [7].

### 5. Result Analysis

Cronbach’s Alpha test checks or measures the reliability or internal consistency between questions. There are at times when during filling out questionnaire, people are not serious or reluctant to give correct, relevant answers. This test evaluates whether answers which were Likert scale questions were answered correctly and be relied upon for analysis. To conduct Cronbach’s Alpha test, all questionnaire questions which were Likert scale questions were included in the statistical set. They were Questions 10-18 (9 questions in total). The calculated value of Cronbach’s alpha test is 0.71. The calculated value is more than 0.7, thus are acceptable in terms of scientific research range. This evaluates that the answers given by 69 respondents to these 9 questions were acceptable and can be taken into consideration when researching the depth of the project questions.

Information technology can bring change in inventory management and it should be applied to the logistics division. Moreover, the important findings for research are based on warehouse and improvement methodologies. Even though employees are satisfied with the current warehouse practices, It can be clearly stated that organizations need to change their traditional work practice and provide a better control over the research methods employed in organization. Figure 3 shows the overall employee satisfaction regarding IT practices.

3: Are you satisfied with the warehousing IT practices in your organization?

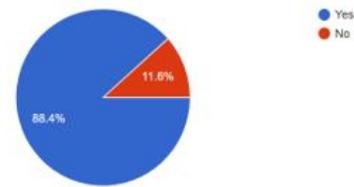


Figure 4: Employee satisfaction regarding warehousing technologies

The warehouse operations and performance would also be changed owing to the research design. Moreover, there would be a space present for information technology. The use of RFID and tagging approach can be implemented for employees if company want to boost performance and understand the requirements of modern technology. The manual records will be transformed towards automatic system. The procurements of raw materials from logistics and inventory would also require innovation. Technology would help to reduce the gap and provide important results for the warehousing practice. Also, by having proper training, there will be the ability to improve both the knowledge and the skill of the employee through which he can discover problems very quickly when they occur [1]. Figure 4 showing that 50 percent of the respondents believe IT assessment has a positive impact on the performance.

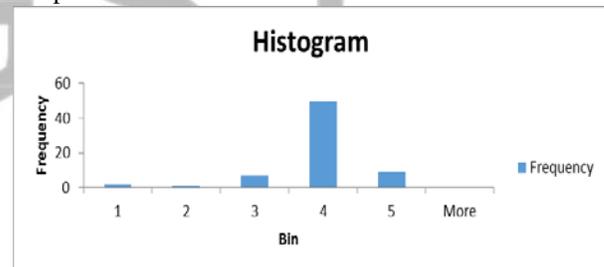


Figure 5: IT assessment has a positive impact on the performance.

Correlation analysis was done between the two questions of the survey. As the figure, it is seen that the correlation between the two questions is 0.138377931. This means that there is a positive relationship between the best mechanisms in IT practices in warehouse and satisfied with the IT storage practices in your organization. Respondents who say that the best mechanisms for IT practices are good and that there is no inconsistency in the satisfaction of technology practices in storage, and that it is in a reasonable direction for that. Hence, it appears that despite the best mechanisms for good technology practices, people are satisfied with the company’s storage practices.

	Need of developing warehousing information technology?	Fix warehousing IT practices
Need of developing warehousing information technology?	1	
Fix warehousing IT practices	0.138377931	1

Figure 6: Correlation Analysis

Through the correlation data analysis, it shows that the employees does feel that warehouse IT system would be suitable for the warehouse management system. The IT system would fix the current management issues present in the warehouse system and make it more effective. The employees presented their point of view regarding the connection between the need of warehouse technology and fixing of practice issues. Furthermore, it is also seen that the diversification is needed at for best idea practice at all. It would provide best measures for the warehouse management.

### 6. Conclusion and Future Research

Warehouse operations for the company can be considered as a prominent role for the business. Oman has remained a country where supply chain and logistics remain important business procedures. The country's considerable portion of GDP is derived from the logistics sector. It was found from the research IT can improve warehouse technologies. RFID and NFC systems were the most favorable option and evidence was gathered from the senior management of the company. Oman does lag in the warehousing system. The primary reason is the awareness and knowledge of the business. Each function of the warehouse is dependent on information technology protocols and business decisions.

Inventory and logistics have been researched for the latest trends and applications to companies. The research can be expanded for the internal factors for the companies. This can be based on warehouse improvement and employer's training. Moreover, research can be carried out in the company logistics polices. Another important area for future research is the relevance of information technology in the warehouse. The key elements of logistics can be explored to have a better understanding of bookkeeping and product delivery

The fluctuation of oil prices and the impact on inventory can also be researched because Oman's major

imports depend on Oil products. The logistics and inventory sector can be improved with new techniques. The scope of NFC tags can also be applied for the Warehouse because it is considered an important area of logistics. Most of the companies lag the technology requirements to control management option.

Future research can also be carried out in recruitment policies. This would demand people with skills and abilities related to warehouse management. There is a gap present for Oman warehousing industry. This gap can be filled by research the area of the company and providing a lead towards business practices.

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