Role of Information Technology on Warehouse Management in Kenya: A Case Study of Jomo Kenyatta University of Agriculture and Technology

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Abstract

The general objective was to find out factors affecting warehousing management. The specific objective was; to determine the effect of information technology on warehouse management.

The researcher used descriptive research design taking Jomo Kenyatta University of Agriculture and Technology as a case for this study. The target population was 930 and a sample size of 50. The sampling design adopted was stratified random sampling. Data collection was done by use of questionnaires and informal interviews.

Majority of respondents (75%), noted that the organization had managed to implement warehouse management system.

The study recommends continued investment and training in information technology and adoption of better information sharing tools.

Keywords: Warehouse management, information technology.

1.0 Introduction

In the current business world, warehouse management as perceived by the industry today is not just managing within the boundaries of a warehouse; it is much wider and goes beyond the physical boundaries. Inventory management, inventory planning, cost management, IT applications & communication technology to be used are all related to warehouse management (Bartezzaghi, 2003). Saleemi (2003) indicate that container storage, loading and unloading are also covered by warehouse management today which is also part of Supply Chain Management (SCM) and demand good management. Even production management is

to a great extent dependent on warehouse management. Efficient warehouse management gives a cutting edge to a retail chain distribution company.

Decades ago, warehousing company managers often shopped for "best of breed" technology to manage their facilities and to track inventory. Systems were implemented with expectations that they would run effectively for fifteen years or more before requiring upgrades. Today, the constant evolution of technology requires a different approach to purchasing warehouse management solutions. Instead of buying a single system rated "very best," managers are happy to purchase exactly what they need right now to evolve and expand their systems (De Boer, 2002). Interoperability and expansion are the key buzzwords right now, since facility managers must be ready to integrate their systems with clients and with other vendors. Overall, the trends affecting warehousing services currently stem from end user demands for speed, efficiency, and environmental awareness (Kouvelis, 2006).

1.1 Problem Statement

Well managed warehouse system help an organization keep proper track of inventory, maintain the levels of inventory as per requirement, increase in accuracy, reduce labor costs and ensure proper maintenance as well as storage of stock. This kind of management will provide ease and convenience to the suppliers and distributors to keep the track of inventory and maintenance as well (Harold, 2002). Thus, warehouse management is very beneficial in storage and maintenance of stock or inventory. Indeed a number of studies indicate that an efficient warehouse management system is crucial to an organization's operational performance Kerridge, 2006; Larson, 2004; Liao 2007). However, many organizations today have not taken the issue of warehousing into account, storage of goods and distributions from the same warehouses are done haphazardly that is without any order, theft cases have been on the rise giving a compromise on the general ethics of workers, due to the disorganization and inadequate incorporation of modern information technology which come with good warehouse management systems, it has resulted to inaccuracy order management techniques which has dealt a major blow to the organization as a whole (Ackerman, 2008; Cooper, 2002).

Information technology has been identified as one of the biggest influencers of the business world today (Bartezzaghi, 2003). Though many believe that information technology mainly benefits large operations that have considerable financial muscle, there is evidence that even small warehouses can benefit from IT innovations. This can be achieved through partial automation of their operations through emerging internet based services (Govindarajan, 2007).

Organizations are trying their best to cut on costs and increase profitability. Warehouse management is one of the areas in which substantial cost savings can be made. Warehouse maintenance cost reduction can only be achieved by making appropriate design decisions on the strategic characteristics of warehouse facilities (Kerridge, 2006).

It is from these issues that the researcher planned to carry out a study based on the factors affecting warehouse management.

1.2 Objective of the Study

The objective was to assess factors affecting warehouse management in Kenya with a specific focus on the role of information technology on warehouse management.

2.0 Literature Review

The main aim of the literature review was to explore the available and existing information which had been covered by the various researchers. The literature was reviewed from journals, the internet, reference books, working, papers, reports and periodicals.

2.1 Theoretical Framework

2.1.1 Management Theory

Different theories have been forwarded to explain the concept of management by different researchers. According to the behavioral theory, management refers to the rule of game within the society/organization which configure individual behaviors, in so doing reducing the uncertainty of risks and transaction costs linked with each individual action. Management science theorists like Herbert and Newman, define management as the application of sophisticated quantitative mathematical techniques for solving managerial problems. Under this theory, an Organization is considered a decision making unit and the main job of a manager is to make decisions and solve problems. It therefore assumes a mathematical model which is a representation of real life situation.

Elsewhere, the term management refers to activities involved in the four general functions of a manager which recur throughout the Organization and are highly integrated. These activities are planning, co-coordinating, leading and controlling. It is therefore universal and focuses more on leadership skills.

The management of the warehouse function in Jomo Kenyatta University of Agriculture and Technology lies with the Chief Procurement Officer and the officer in-charge of central stores. They are assisted by other operational officers under them but they bear the managerial responsibility.

2.2 Information Technology

Warehouse Management Systems (WMS) have been available since the earliest computer systems and were allowed simple storage location functionality. Today WMS systems can be standalone or part of an Enterprise Resource Planning (ERP) system and can include complex technology such as Radio Frequency Identification (RFID) and voice recognition. However the basic principle of the warehouse system has remained the same, which is to provide information to allow efficient control of the movement of materials within the warehouse. The implementation of a WMS is often complex. Project planning is critical to the success of any WMS implementation. The project requires warehouse resources to collect data on the physical warehouse, materials, inventory as well as defining the strategies required to operate the warehouse. There is the added challenge of implementing the system whilst still operating the warehouse (Kerridge, 2006).

The complexity of a WMS implementation varies with every business. The physical dimensions and characteristics of each item in the warehouse are required to be collected and entered into the new system. According to Hamzah (2001), capacity calculations require the physical size and weight of the item as well as the dimensions of all the storage bins or racks in the warehouse. The storage options for each item are required, for example if the item can be stored separately, in box, pallet or if it can be stacked. Each item must be reviewed to see if it is physical limitations on its storage, such as requiring refrigeration. Hazardous material information needs to be collected so that the item is not stored in certain areas. This information is only part of the requirements of the WMS implementation. The system requires decisions or configuration to be made on how items are to be placed or

removed from the system, in what order, for what types of materials and what methods of placement and removal should be used (Hamzah 2001). The implementation requires significant input from the resources that operate the warehouse on a day to day basis and this can be a strain on warehouse operations. A successful project will recognize this fact and ensure that the key personnel required for the implementation are given adequate back up so that warehouse operations do not suffer (Gupta, 2003).

According to Harold (2002) after the successful launch of the WMS system, many businesses will find that the resources required to operate the system is greater than prior to the implementation. This is primarily due to the data intensive nature of the software and the fact that warehouses are in a state of flux; racks are moved, placement and removal strategies changed, new items added, new processes developed. Warehouse accuracy is paramount for the software to operate and to do this data will need to be entered accurately and in a timely fashion. Although most WMS implementations will reduce labor costs in the placement and removal of materials, there is often an added warehouse management function required just to operate the software. Despite the complexity, WMS implementations do offer businesses significant benefits. Not only will placement and removal cycle times be reduced, but inventory accuracy should be improved as well as increased storage capacity, more organized storage of materials and greater flexibility of warehouse operations.

This area of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems in the 1960s and developed through the 1990s by the introduction of Enterprise Resource Planning (ERP) systems. The area has continued to develop into the 21st century with the expansion of internet-based collaborative systems. It is characterized by the rapid growth of technologies. The way to capture their competitive advantage has become the most important issue for enterprises in the rapidly changing and uncertain business environments. Many researchers have pointed out that the adoption of technology is the most important tool for enterprises to keep their competitive advantage (Lazarus, 2000).

Large organizations are procuring goods electronically because it is cheaper to do so and they get economies of scale, within a few years smaller businesses will follow suit. How does e-procurement affect the business? Some of the traditional face to face aspects of selling will diminish in importance, certainly in the early stages. The existing relationship with a customer may no longer be guaranteed as organization/institution implementing e-procurement search wider to find new suppliers. This increased competition will lead to tighter margins in a given organization. The very process of e-procurement opens up new markets for you. It's a new way in for you and your company to bid for jobs in sectors you may previously have felt excluded from (Harold, 2002).

Realigning your business to adopt e-procurement can be a challenging experience. However, practice makes perfect and once you have experienced the process, you will find it becomes second nature to do business the electronic way. In addition, there is no reason why a company couldn't use the same e-procurement process to purchase your own goods and services – ensuring the best quality at the best price. Computer technology has provided opportunities for improving management. Computerized inventory management systems have the capability to manage and process large volumes of data quickly and provide reports. It is important to be aware of which systems are currently available in the marketplace and what they offer of inventory information (Everett, 2001).

Most computer management systems track the instrument set through all processes and services. Others have additional options, such as instructional features on line, instrument

preventive maintenance reminders, and employee tracking for productivity. Take time to review literature and assess different systems and costs. Although an automated system may require a substantial initial investment, it has proven to be a cost effective instrument management program. Scanning ensures accuracy of data entry. Instrument sets are scanned at specific workstations in order to know the location and status of any set at any time. Surgical instrument sets can be identified with a bar code label that identifies each set. Labels can be affixed to inner baskets and outside of containers and to the outside of trays that are wrapped. Computers track the flow of sets through the department and at each stage of the processing department. First, instrument sets are scanned when they enter the decontamination area. Scanning creates a record that the tray is there. The tray is scanned when the set arrives in the prep and pack area for assembly, when sterilized, and when delivered to the operating room or storage area (Lazarus, 2000).

According to Harold (2002), through technology, one can gain cost advantage through pioneering lower cost products design and creating low-cost ways to perform needed operations, thus supporting differentiation by pioneering unique or services that increase buyer value and thus command premium prices. And in some cases technology can completely change the values of competition within an industry. An organization may benefit by developing a new technology within the company by providing an advantage over competitors. Adopting a new technology typically requires changes in the ways jobs are designed. The task is redefined to fit people to the demand of the technology to maximize the technology's operation but often fails to maximize the total productivity because it ignores the human parts of the equations. Thus, the social relationship and human aspects of the task may suffer, lowering overall productivity.

According to Gupta (2003), technology is probably one of the most widely used and latest precisely defined terms in business and it is something that affects businesses in all forms and activities. Information technology does make extra-ordinary contribution to organization productivity. Nevertheless the same exciting technology produces negative consequences for example intensive use of information reformats customer service as follows: the managers or employees become computer goofs, they spend so much time attempting new computer routines and accessing information of questionable value that they neglect key aspects of customer service. A problem of considerable magnitude comes from the deterioration in customer service that sometimes accompanies information technology. Many banks for example force customers with a service problem to use toll free numbers rather than allowing them to deal with a branch representative. A voice response system instructs the customer to punch in lengthy account numbers and make a choice from a complicated menu. The process is time consuming and personal (Liao, 2007).

According to Larson (2004), explains that conflicts in managing systems and processes arise when they do not deliver to users what they are expected to deliver. Users expect an appropriate design and full support, if either of these are lacking, they are rightly angry that is; their design does not take sufficient account of user needs and is not user friendly. They no longer serve their original purpose. The manager pays insufficient attention to developing them to meet new demands. Support from technicians is inadequate thereby relying heavily on a computer system which is prone to failures. The reason why businesses should want to develop information systems is because it improves customer service. Computer systems can often allow organizations to serve customers more quickly or to provide them with additional services. To improve management information, management decisions can only be as good

as the information on which they are based, thereby enabling managers to institute new types of enquiry when changing business conditions, demand new or different information to secure or defend competitive advantage.

According to Sagimo (2002), Sigma is the combination of tools, machines, computer skills, information and knowledge that managers use in the design, production and distribution of goods and services, and technological forces are outcomes of change in the technology that managers use to design, produce or distribute goods and services. These forces have profound implications for managers and organizations. Technological changes can make established products obsolete forcing managers to find new ways to satisfy customers' needs. Although technological change can threaten an organization, it can also create a host of new and better kinds of goods and services. Although most WMS implementations will reduce labor costs in the placement and removal of materials, there is often an added warehouse management function required just to operate the software hence, managers must move quickly to respond to such changes if their organizations are to survive and prosper.

3.0 Research Methodology

The researcher used descriptive research design. According to Mugenda and Mugenda (2003), the design is preferred because it is concerned with answering questions such as who, how, what, which, when and how much. The method was appropriately used enable the researcher to analyze the objectives tentatively and also the validity and reliability of the result. This type of research design reports things the way they are and attempts to describe such things as possible behavior, attitudes, values and characteristics. The study aimed at describing the state of affairs as it is and therefore considered the descriptive research design to be the most appropriate for this study.

The target population of the study was public universities in Kenya which number thirty two. Jomo Kenyatta University of Agriculture and Technology (JKUAT) is chosen as representative case study because it is a fairly large university, has been in existence for more than twenty years and has a fairly developed warehouse operation. The sampling frame list was obtained from human resource department of the University. The respondents of this study were senior, middle level and procurement department staff members in JKUAT. In the study, stratified random sampling was used to select respondents in the first two categories i.e. senior and middle level categories. This technique made all potential respondents within these two categories to have an equal and unbiased chance of participating in the study. All procurement staff members were included in the sample as it is the host department of the warehouse function and therefore procurement staff were deemed to have the most information relating to the subject matter.

According to Kothari (2002) as a rule of thumb the sample size should be at least 30 respondents though it will also be determined by target population size. This study took 50 respondents in order to give a better picture and cushion the researcher in case of a lower response rate. This study used both primary and secondary data tools to collect the data. Primary data collection includes raw data that was collected from the employees through distributed questionnaires. The researcher personally administered the questionnaires to the respondents. Empirical and theoretical literature from books, journals and the internet were sourced for the purpose of collecting the secondary data.

Data collected through the questionnaires was edited and coded for analysis. It was analyzed quantitatively and qualitatively. Quantitative data was analyzed through the use of

descriptive statistics. Tables, charts and percentages were used for data presentation through the help of Microsoft Excel package. Qualitative data was analyzed through content analysis. The analyzed data is presented in a user-friendly manner through tables, charts and graphs.

4.0 Results of the Study

An over whelming majority (90%) indicated they had undergone some form of computer training while a minority (10%) had not. An understanding of computer operation is essential in a working environment that uses a computerized warehouse management system.

While asked to expound on the nature of computer training that they had undergone, the respondents indicated that they had acquired knowledge of the basic computer operating system particularly Microsoft Windows System. Further, 60% of the respondents indicated they had been trained on the use of the University's Sage ERP system which houses the organization's warehouse management system which is a plus to the validity of their responses.

The respondents were asked to express their opinion on the effect of the organization's computerized warehouse management system. An overwhelming majority (95%) indicated that the system effect was positive while a minority (5%) indicated that the effect of the system was negative. Probed further on the effect the system was having on warehouse management in the organization a majority sited (80%) cited the issues of increased speed of service at the stores and accuracy of records of stores transactions among other positives. Those that were of the view that the system had negatively impacted warehouse management said it was not possible to get items for use from the store when power was out or when the computerized system was down due to technical hitches.

5.0 Discussion

It can be argued that in respect of the findings of this study information technology affects warehouse management as an overwhelming 90% of the respondents were of this view. It can further be argued that the effect is a positive one, with the support of 95% of the respondents.

An increasing number of Kenyans are now fairly knowledgeable about one kind or another of information technology and its use. In particular, many, especially among the young generation are computer literate. The findings of the study are also in agreement with this as more than 90% of the respondents indicated having undergone one form of computer training or another. The current government under the Vision 2030 blue print has put a lot of emphasis on growth and adoption of ICT technologies to improve effectiveness and efficiency of service delivery.

Respondents have indicated that use of information technology in the warehouses has become very important. This is because information technology have given opportunity to develop computerized management systems that can be applied in warehouse management these systems have therefore given platform for enhanced data security, work efficiency, consistency services and general improved performance of warehouses.

6.0 Conclusion

In conclusion of the study on challenges facing warehouse management in Kenya, the complexity of a WMS implementation varies with every business. The physical dimensions and characteristics of each item in the warehouse are required to be collected and entered into the new system. This information is only part of the requirements of the WMS

implementation. The system requires decisions or configuration to be made on how items are to be placed or removed from the system, in what order, for what types of materials and what methods of placement and removal should be used.

7.0 Recommendations

Information technology implementation comprises of various operations systems that organization can adopt in order to improve performance of various functions. It is recommended that organizations should strive to ensure warehouses are adequately automated by management systems that can improve how warehouses can be managed. Further training on information technology is also recommended for employees.

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