INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 5, Issue 6, (2015) E-ISSN: 2222-6990

Role of Electronic Data Interchange On Supply Chain Performance in Cargo Distribution Management in Kenya: A Case of Mombasa Port

Robert Wachira Kiggira
College of Human Resource Development, Jomo Kenyatta University of Agriculture and Technology, P.O box 62000 – Nairobi, Kenya.
Email: robertkiggira@gmail.com

Dr. Fred Mugambi Mwirigi, PhD
College of Human Resource Development, Jomo Kenyatta University of Agriculture and Technology, P.O box 62000 – Nairobi, Kenya. Email:fmgambi@gmail.com

Dr. Noor Ismail Shale, PhD
College of Human Resource Development, Jomo Kenyatta University of Agriculture and Technology, P.o box 62000 – Nairobi, Kenya.
Email:Shalle60@hotmail.com

DOI Link: http://dx.doi.org/10.6007/IJARBSS/v5-i6/1651

Published Date: 03 June 2015

Abstract

The research project is an investigation into the role of E.D.I on supply chain performance in the cargo distribution management in Kenya. The Port of Mombasa is the major gateway to Kenya's international trade by sea handling 22 million tons of goods in 2013 (KPA, 2014). This represents double the volume of Dar es Salaam Port and only 4% of the volume 557.5 million tons that was handled through the port of Singapore. Over the last decade, the Government and the private sector have invested heavily in the improvement and modernization of the transport infrastructure and services aimed at improving trade facilitation. Some of these investments include the dredging of the Mombasa Port, completion of Berth 19, construction of the second container terminal, development of Embakasi ICD, focus on regional road links, privatization and improvement of weighbridges, customs modernization project, the standard gauge railway line, development of KRA Simba

2005 System, and the E.D.I.. Despite all these, issues still remain (African Universal Consulting, 2014).
The objectives of the study are the roles of E.D.I corporate policies, employee training, and volume of cargo processing and employee culture on supply chain performance in the cargo distribution management in Kenya's Mombasa Port. The research used descriptive research design as it provides information on the characteristics of the phenomenon. The population was 167 employees of the Mombasa Port and the population sample was 50 employees who work at the operations department both at the office and in the field and amongst them,5 line managers were selected purposively . The response was 70% successful with a response of 35 out of 50 respondents. The sampling design that was used is the stratified random. A pilot test was done with the key informants before the full administration of questionnaire. Nevertheless, the researcher used questionnaires as the main method of data collection, although interviews and observations were applied as well. Data was then analyzed using the quantitative and descriptive statistics, then presented using tables and pie charts, whereas the quantitative data was coded and data was be entered in SPSS for analysis. The findings from this study showed that E.D.I plays a great role in the cargo distribution management at the Mombasa Port, although there are issues which include; inadequate non IT staff training, lack of trust of other EDI partners, negative staff employee culture by some employees and stakeholders, more requirements of changes in business requirements than expected, unforeseen technical problems and the system compatibility problems. In conclusion, a well adopted, planned and executed EDI roles and application process is necessary for the cargo distribution management at the Mombasa Port.
Keywords: Role, Electronic data interchange, Supply chain performance, Cargo distribution Management, Kenya and Mombasa Port.

Introduction

Electronic data interchange is the computer to computer exchange of business data in an agreed format (Noor, 2003).In addition to that, Electronic data interchange is the structured transmission of data between organizations by electronic means. It is used to transfer electronic documents or business data from one computer system to another i.e. from one trading partner to another trading partner without human intervention. It is more than mare e- mail, for instance organizations may place bills of lading and even chaque with the appropriate EDI messages. It also refers specifically to a family of standards.

Electronic data interchange is one of the most discussed business-to-business topics of today. It has become a tool for adapting and rendering business processes towards an integrated logistics. Electronic Data Interchange (E.D.I) has been used as a technique for communicating between different computer systems since the 1960's. However, it took another 20 years for EDI to support different types of business processes (Lee, 2009). In the 1970's, several industries sponsored a shared EDI system that they usually turned over to a third party network.

Statement of the problem

The Port of Mombasa is the major gateway to Kenya's international trade by sea handling 22 million tons of goods in 2013 (KPA, 2014). This represents double the volume of Dar es Salaam Port and only 4% of the volume 557.5 million tons that was handled through the port of

Singapore. Over the last decade, the Government and the private sector have invested heavily in the improvement and modernization of the transport infrastructure and services aimed at improving trade facilitation. Some of these investments include the dredging of the Mombasa Port, completion of Berth 19, construction of the second container terminal, development of Embakasi ICD, focus on regional road links, privatization and improvement of weighbridges, customs modernization project, the standard gauge railway line, development of KRA Simba 2005 System, and the E.D.I. However, despite all these, challenges still remain especially the transport inefficiencies at the Mombasa Port (Africon Universal Consulting, 2014). Thus the reason that necessitated the researcher to undertake the study.

The port handles a mixture of containerized cargo, dry bulk cargo, general cargo and liquid bulk goods consisting mainly of crude and petroleum products. In 2013, more than two thirds of the port throughputs amounting to 19,150 million Tons were imports accounting for 87% of the traffic with transit cargo estimated at 30% (KPA, 2014). The Mombasa Port scores low in-terms of volume of business handled by international standards cargo dwell time which was 6.5 days in 2011 to 5 days in 2012. Despite these improvements, the efficiency at the port of Mombasa is still below the internationally acceptable standards of a maximum 3 days dwell time (East African Logistics Performance Survey, 2012).

Objectives of the study

General Objectives

The main purpose of this study was to analyze the role of E.D.I on supply chain performance in cargo distribution management at the Mombasa Port.

Research Objectives

i. To determine the role of E.D.I corporate policies on supply chain performance in cargo distribution management at the Mombasa Port.

ii. To establish the role of E.D.I employee training on supply chain performance in cargo distribution management at the Mombasa Port.

iii. To examine the role of E.D.I volume of cargo processing on supply chain performance in cargo distribution management at the Mombasa Port.

iv. To evaluate the role of E.D.I employee culture on supply chain performance in cargo distribution management at the Mombasa Port.

Research questions

i. To what extent does the role of E.D.I corporate policies on supply chain performance in cargo distribution management at the Mombasa Port?

ii. What is the E.D.I employee training on supply chain performance in cargo distribution management in at the Mombasa Port?

iii. Is there any role of E.D.I volume of cargo processing on supply chain performance in cargo distribution management at the Mombasa Port?

iv. What is the role of E.D.I employee culture on supply chain performance in cargo distribution management at the Mombasa Port?

Research scope

The scope of this research was the employees of the Kenya Ports Authority at the Mombasa Port in the Mombasa County, who work at the operations department. The organization itself which is the K.P.A was accessed whether its use of E.D.I had a role to what extent in the management of cargo. The study was strictly limited to the Mombasa Port staffs of the operations department both during the day shift and night shift who have been working for the organization in the past five years and above.

Literature review

This chapter on literature review focused on the various literatures on E.D.I. The literature was reviewed from, working papers, journals, books, reports, periodicals and internet sources as it also presented a conceptual framework reflecting identified independent and dependent variables. Electronic data interchange is one of the most discussed business-to-business topics of today. It has become a tool for adapting and rendering business processes towards an integrated process. Electronic Data Interchange has been used as a technique for communicating between different computer systems since the 1960's. However, it took another 20 years for EDI to support different types of business processes (Lee, 2009).

EDI emerged in the 1970's primarily driven by the recognition that firms in transaction and economic relationships were wasting time and money printing, transferring and re-key inter-business transaction data. To avoid this cumbersome process a group of firms collaborated and agreed on common formats and structures for exchanging computer- based data. This development meant that the information from points of sales terminals could now be linked to the inventory management systems enabling the points of sale to keep up the minute track of the status of inventory (Vogt, 2002).

Theoretical review

The theoretical framework of a project research relate to the philosophical basis on which the research takes and will form the link between the theoretical aspects and the practical components of the investigation being undertaken. The theoretical framework therefore "has the implication of every decision being made in the research" (Martens, 1998).

Diffusion of innovation theory

Diffusion of innovation theory describes the process through which new ideas, practices, or technologies are spread into a social system (Rogers, 2004). Everett M. and Rogers 2004 were the most prominent developer of diffusion of innovation theory. His book, Diffusion of Innovations, was first published in 1962 and is now in its fifth edition. Formalized research on the diffusion of innovations began in 1943 with a study by Bryce Ryan and Neal Gross, from the field of rural sociology, on the diffusion of hybrid corn in Iowa (Rogers, 2004). Diffusion of innovation theory has since spread to many different fields, and thousands of studies support its tenets.The academic disciplines in which the theory has been applied include anthropology, communication, geography, sociology, marketing, political science, public health, and economics (Moseley and Rogers, 2004).

Diffusion of innovation theory holds that innovation diffusion is "a general process, not bound by the type of innovation studied, by who the adopters are, or by place or culture" (Rogers,

2004), such that the process through which an innovation becomes diffused has universal applications to all fields that develop innovations. Diffusion is defined as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2004). An innovation is defined as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2004). Examples of innovations in the counseling profession include new and revised counseling techniques, theories, practice materials, assessment instruments, and technologies such as the Practice of management software.

Resource based theory

Resource based theory emphasizes that each firm is characterized by its own unique collection of resources of core competencies. The source of competitive in the creation and exploitation of distinct capabilities that are difficult to build and maintain ,codify and make into recipes, copy and emulate and cant simply be bought off the shelf (Kenneth, 2012). Theory built on the resource-based view believes this postulate; i.e., IT can affect productivity but cannot directly affect firm profit, as IT is copied by other firms and therefore not a source of competitive advantage.

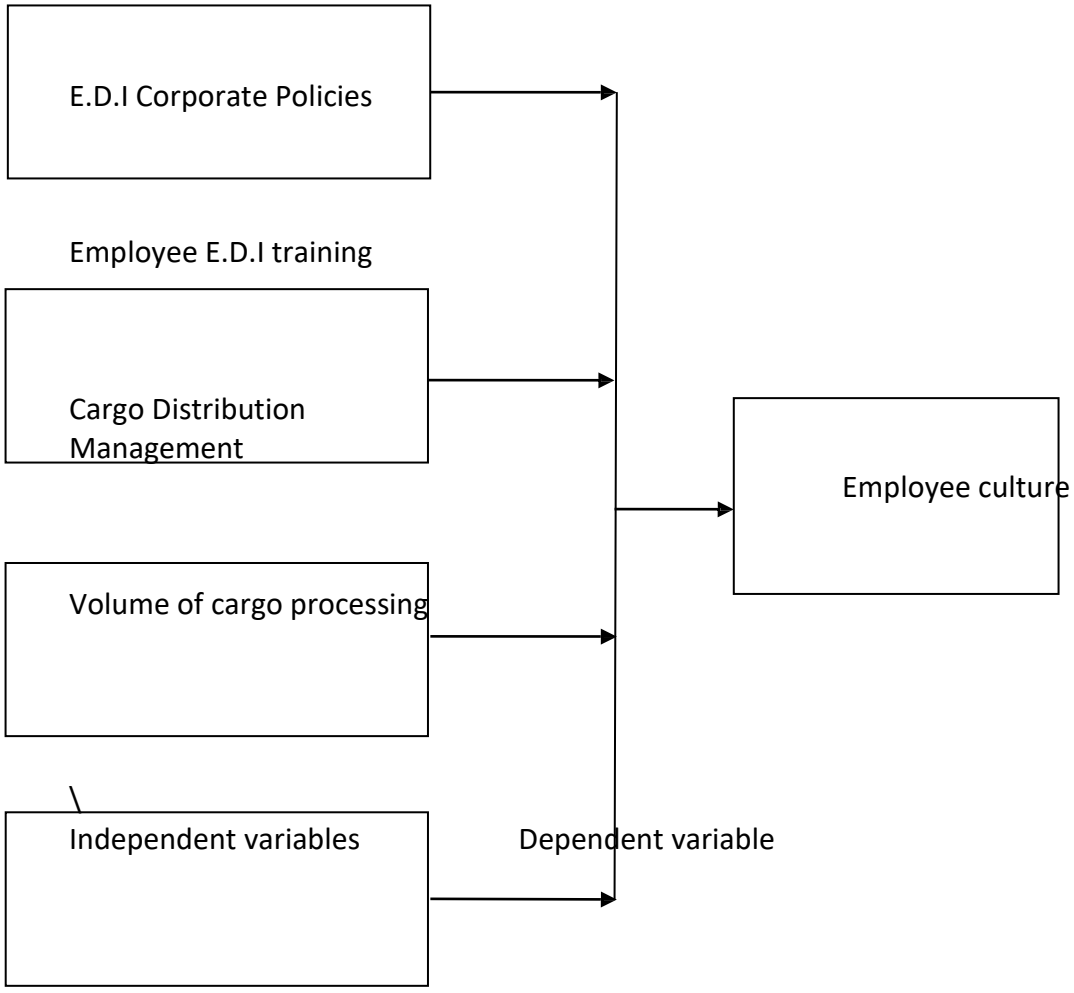
This view states that sustained competitive advantage comes from resources that are valuable, rare, and imperfectly imitable. This view states that IT is neither rare nor imperfectly imitable; it cannot be a source of competitive advantage, and therefore cannot increase firm profits. However, RBV theorists believe that even though IT Expenditure cannot have direct effects on firm profits, the combination of expenditure on IT and expenditure on other resources can jointly have an effect on profits Melville in 2004 develop a model of IT Business Value from the resource-based perspective, in which IT is combined with other organizational resources and is deployed within business processes to improve business process performance, which in turn contributes to organizational performance (Melville et al 2004) make a significant contribution in developing an RBV based model. In this model, investing in Information Technology does not create value on its own; rather, the firm has to invest in other resources and the combination of investments make the organization more productive and profitable. In addition, information systems implementations need considerable organizational change to succeed, including additional investments in other physical assets following the theoretical work; a few recent studies have started looking for indirect effects of IT (Zhang et al, 2007).

Transaction cost theory

The transaction cost theory associated with Coase and Williamson, refers to the idea of the cost of providing for some good or service if it was purchased in the market place rather than from within the firm. Three key concepts are those of transaction costs, asset specifity and asymmetrical information distribution (Kenneth 2012). Asset specifity is the relative lack of transferability of assets intended for use in a given transaction to other users.Asymetrical information distribution means that the parties to a transaction have uneven access to relevant information. One consequence is that, within a contractual relationship, either party may engage in post contractual opportunism if the chance of switching to more advantageous partnerships arises (Kenneth 2012).

As companies tend to function more and more in networks (Castells, 1996), while supply chains tend to lengthen and become more complex, a broader application of transaction cost theory may be required. While Information technology (E.D.I) is an instrument in reducing transaction costs, the role of physical infrastructure itself should not be underestimated. The aim of this theory is to show the importance of physical infrastructure for reducing transaction costs and the use of transaction cost economics for analyzing supply chains. Transaction cost economics is strictly related to the notion of governance, which is a broader concept than organization. In the economic context, management concerns different types of organizational structures which range from markets to different forms of hierarchies and networks involved in any kind of economic activity (Platje, 2011).Management structures are a way to support cooperation and reduce any kind of conflict determined by the level of transaction costs. Transaction costs is a heuristic device analyzing how easy or difficult it is to make any type of exchange, which basically exist due to the measurement and information problems appearing due to the heterogeneity of goods while people are fallible, have limited cognitive abilities and tend to behave opportunistically (Platje, 2011).

Figure 1 Conceptual framework



Independent variable. E.D.I corporate policies.
A Policy is a statement that describes in a very general terms the intended course of action. A policy serves as guidelines in making operating decisions that channel actions towards the achievement of objectives (Oxford dictionary, 2002).In relation to the E.D.I which is basically integrative of the operations in an organization, its policies ought to be clear to the employees of the organization that embraces the E.D.I for a proper operations management defined as design, operation and improvement of the systems that creates and delivers the firms primary products and services (Richard, 2010).The Parties to a distribution agreement undertake to implement and maintain security procedures and measures to ensure the protection of EDI messages against the risks of unauthorized access, alteration, delay, destruction, or loss. Security procedures and measures include verification of origin, verification of integrity, nonrepudiation of origin and receipt, and confidentiality of EDI messages. EDI messages shall not be regarded as containing confidential information to the extent that such information is in the public domain. The parties may agree to use a specific form of protection for certain messages such as a method of encryption to the extent permitted by law in either of their respective countries.

Other E.D.I messages or other data transmitted to the other Party include personal data; such data shall be received, processed, and stored in accordance with the terms of the distribution agreement between the Parties, and the receiving Party agrees to comply with same for its processing of the data. EDI messages with personal data originating in the European Economic Area and transmitted to the receiving Party outside the EEA shall be processed by the receiving Party in accordance with a "safe harbor" arrangement or by adhering to the terms of a separate model data transfer agreement (Noor, 2003).

Employee E.D.I training
This refers instilling competencies that are to be exhibited by an employee in undertaking a task in relation to his/her occupation. In a given occupation, Training, qualifications and skills go hand in hand in the execution of responsibilities given to an employee with respect to his/her area of work that is, may be an example of the Operations department (Torrington, 1991).Input from employees and information on customer requirements is essential in maintaining cargo distribution management at the Mombasa Port. Computer applications allow organizations to build a data base to track customer satisfaction, analyze complaints, and obtain employee's feedback for ways to improve customer satisfaction. Employees in most institutions are usually opposed to introduction of computerized systems such as the electronic data interchange for fear of lack skills to use the technology (Armstrong, 2006). In order for computerization to be efficient, they have to be used by experienced personnel who have undergone training. Adoptions of computerized systems such as E.D.I require changing existing business processes to the "best practice" approach that the software embodies.Manpower planning is the "process by which management strives to have the organization move from its current
manpower position to its desired manpower position (Armstrong, 2006). Through proper planning and training prior to the use of a computerized system such as the electronic data interchange; the management strives to have the right time, doing things which result in both

the organization and the individual receiving maximum long-run benefit thereby improving the cargo distribution management.

Volume of cargo processing

Before the implementation and adoption of KWFP, majority of the processes in the port of Mombasa were not automated. These processes include the submission of the hard copy vessel bay plans by the shipping agents to KPA, data collection process at the waterfront and other sites, container inventory management and the requirement of the mandatory six copies of the Mombasa Port Release Order thus making the declaration process quite lengthy.Information in EDI form is exchanged between KPA and the other stakeholders through the United Nations Electronic Data Interchange for Administration, Commerce and Transport formats and supplemented by private formats . The EDI files exchanged in the shipping industry include BAPLIE for vessel bay plan, MOVINS for vessel pre plan, COARRI for discharge/Loading, CODECO for gate-out container logistic movements, CUSCAR for manifest and APERAK files for message receipt acknowledgement. Files are transmitted via email from the port users to KPA and the users pick information relevant to them from KPA's file transfer protocol (ftp) site. Other information is also available to the users through the web interface provided by KPA (Kilindini Waterfront Project, 2006).

KWFP is a computerized information system that facilitates the running of the water front and cargo operations in the port of Mombasa. It was inaugurated on 10th January 2006 and went live on 1st of July 2008. The project covers Container Terminal Operations, Conventional Cargo Operations, Marine Operations and the Inland Container Depots in Nairobi and Kisumu (Total Soft Bank, 2007). The stakeholders in this project are Kenya Ports Authority (KPA) which manages the Port of Mombasa, Kenya Revenue Authority under which customs falls and Kenya Bureau of Standards who regulate the standards of the cargo passing through the port .Other stakeholders include Shipping Lines whose vessels call in the port of Mombasa and Clearing and Forwarding agencies that operate in the port (Magutu, Lelei and Nanjira 2010).

Employee culture

Input from employees and information on customer requirements is essential in maintaining an efficient inventory management. Computer applications allow organizations to build a data base to track customer satisfaction, analyze complaints, and obtain employee's feedback for ways to improve customer satisfaction (Harvard Business School, 1994).Employees in most institutions are usually opposed to introduction of computerization for fear of lack skills to use the technology. In order for computerization to be efficient, they have to be used by experienced personnel.

Implementing computer systems such as EDI require changing existing business processes to the "best practice" approach that the software embodies (Khosrow et al, 2006).Manpower planning is the process by which management strives to have the organization to move from its current manpower position to its desired manpower position (Eric, 2002). Through proper planning prior to computerization, the management strives to have the right time, doing things which result in both the organization and the individual receiving maximum long-run

benefit thereby improving the effective management of cargo at the Mombasa Port. Efficiency in this case in relation to the attitude of the employees will refer to the organizations Ability to use electronic data interchange system that will allow customers to requisite for their cargo in real time thus improving efficiency in terms of time saved moving from one department to the operations department in an attempt to clear cargo.

Dependent variable.
Cargo distribution management.
The Port of Mombasa is the gateway seaport for East Africa's trading route. The port handles a mixture of containerized cargo, dry bulk cargo, general cargo and liquid bulk goods consisting mainly of crude and petroleum products. In 2013, more than two thirds of the port throughputs amounting to 19,150mill Tons were imports accounting for 87% of the traffic with transit cargo estimated at 30%. A small container yard with a design capacity of 250,000 TEUs, cumbersome clearance procedure; poor rail off-take resulted in clearance bottlenecks at the port. (KPA Handbook, 2014) The introduction of customs data interchange system and the container freight stations in 2005 to 2010 helped in reducing the bottlenecks at the port. The government investment in dredging at port, the development of berth 19 and the ongoing development of the new container terminal are some of the initiatives intended to clear the existing bottlenecks and revamp the port as the Port of choice in Eastern and Southern Africa region. The above mentioned improvements are expected to enhance trade volumes through the port. The recently launched standard gauge railway line from Mombasa to Nairobi is currently under implementation and due for completion in 2017.

This is expected to tremendously improve rail off-take at the port which according to Rift Valley Railway (RVR) figures is currently at 5.4%. The current railway concession by RVR is also improving with upgrade being undertaken to improve track, general infrastructure and equipment capacity. There is also planned roads up-grade around the Port which is at an advanced stage. These include the Dongo-Kundu bypass and the realignment of the port exit route. The Lamu South Sudan Ethiopia Transport Corridor (LAPSSET) is expected to relieve Mombasa Port of the trade volume transiting to and from Ethiopia and South Sudan as well as some domestic cargo currently being handled by the Mombasa port. The LAPSSET Corridor is currently under the implementation with the first three berths due to commence construction.

Critique of Existing Literature
Although extensive research has generally been documented, few studies have been undertaken in Kenya on the role of E.D.I on supply chain performance in the cargo distribution management. (Magutu, Lelei and Nanjira, 2010) looked at the benefits and challenges of E.D.I implementation and application at the Kilindini Waterfront Project in Kenya. The study found out that, despite the robust potential of the E.D.I system, it comes with both the benefits such as access to information, standardized programs and improved trading partner relationship. Moreover, it has got challenges such as the high maintenance cost as well as inadequate feedback from the E.D.I project managers. However little attention has been given to the role of E.D.I on supply chain performance in the cargo distribution management.

In addition, the role of E.D.I attributes to cost reduction and efficiency on supply chain performance in the cargo distribution management, in spite of the challenges that its adoption and application would confer to the organization and its stakeholders at large (Kenneth, 2006). Others studies which have been carried out include: (Philip, Joshua and Oluwagbemi, 2011) conducted a study aiming at the development of a window based security system for E.D.I identifying and proposing solutions to problems encountered in E.D.I applications; (Abubakar, Melati and gengeswari, 2008) studied the factors influencing the implementation of E.D.I; this study accepts that the main purpose of E.D.I is to increase efficiency of all organizational processes. The Researcher aimed to research on the role of E.D.I on supply chain performance in the cargo distribution management.

However, the major challenges that were addressed by the study objectives have not been adequately explored and this leaves some major gaps that will need to be filled by further research undertakings. This study has clearly established these gaps as; tangible costs and time gap. The research study therefore concentrated its research activities towards filling these gaps by identifying an appropriate solution to them.

It was nimble and agile enough to respond to a market that is seeing growth driven primarily by new products, good services and good technology. Research work done by other scholars in this field has not gone deep to analyze the role of E.D.I on supply chain performance the in cargo distribution management. The researcher went down and critically analyzed the role of E.D.I on supply chain performance in cargo distribution management in Kenya, with reference to K.P.A, Mombasa. The Researcher established that a computerized system like E.D.I is a business tool that integrates all the applications required by an organization as a whole, and connects the organization to other enterprises in a network form. Computerized systems such as E.D.I are usually compromised of several modules such as: a financial module, a distribution module, or an operations module. Today, computers have added new functions such as supply chain management, product data management, electronic commerce and warehouse management. Computerization opens a window of opportunity for businesses to compete globally, respond to competitive pressures. An E.D.I system facilitates company-wide Integrated Information System covering all functional areas like financial acknowledgement, financial reporting, Payables, Receivables, Accounts, scheduling of vehicles, Purchases etc. E.D.I performs core business activities and increases customer service satisfaction. In addition to facilitating information flow across different sections or departments of the organization. It also bridges

the gap between business partners allowing ongoing collaboration, as well as creating a good solution for better project management. Much will need to be done to enable the common man understand the role of E.D.I in the effective management of cargo. Without the integration and the understanding of the two, logistics of cargo and Efficiency in managing the supply chain process would be a problem. For any organization to be productive and to reduce unnecessary cost on supply chain, it must ensure her task environment is conducive to her operations and thus attains her objective and goals.

Research gap

Past researchers focused on the factors affecting E.D.I on the cargo management and cross-functionality. However, the major areas that have been addressed by the study objective and the statement of the problem leave some major gaps that will need to be filled by further

research undertakings. This study established these gaps as; proper planning and cost reduction gaps as each and every company's major concern is to maximize profits. The research study therefore concentrated its research activities towards filling these gaps by identifying an appropriate solution towards cost reduction by use of E.D.I.It will have to be nimble and agile enough to respond to a company that has been implementing new systems in their business processes. Research work done by other scholars in the past especially this field wasn't deep to analyze the roles of E.D.I on supply chain performance in the cargo distribution management.

Summary

E.D.I is ideal in the cargo distribution management in Kenya since all containers can be treated in accordance with relatively simple set of rules and the vast amount of work involved in the calculations and can be done quickly and accurately.E.D.I can be constantly updated and a review instituted as often as is necessary. This reduces the internal lead-time for supply of materials in terms of cargo and when linked with the automatic printing of orders can substantially reduce the amount of stock to be carried thereby increasing internal customer service. Automatic hastening and, if necessary, progressing of orders can be undertaken, and this may enable reductions to be made in safety cargo levels, particularly if linked to a supplier's performance record.

E.D.I facilitates cargo distribution management and the volume of cargo processing to the minimum monetary value consistent with the degree of service, providing up to date information concerning cargo distribution management. E.D.I is used in the cargo distribution management at K.P.A through the custom built system amongst others such as K.W.A.T.O.S. This E.D.I system integrates information technology use to all cargo distribution management functions in K.P.A. Cargo distribution management is a significant asset in most logistical organization such as the Maersk and SDV Transami and K.P.A has understood that its effective , therefore, is a key task within the auspices of logistical operations. But controlling cargo is far from easy, it involves a complex set of decisions due to the many forms of cargo and therefore an information technology system that is able to perform various cargo management functions should be implemented to increase efficiency (Johnson and Scholes, 2002).Generally cargo are the result of functional policies within an organization as well as the short and long term

decisions in purchasing, logistics, operations and sales. There is therefore need for K.P.A to integrate information systems in their cargo distribution management operations in order to exercise effective management at the highest level of management as well as the detailed control system and procedures to be used lower down in organizations operations thus enhancing efficiency (K.P.A, 2011).

Research Methodology

The research used descriptive research design as it provides information on the characteristics of the phenomenon. The population was 167 employees of the Mombasa Port and the population sample was 50 employees who work at the operations department both at the office and in the field and amongst them, 5 line managers were selected purposively. The response was 70% succefull with a response of 35 out of 50 respondents. The sampling design that was used is the stratified random. A pilot test was done with the key informants

before the full administration of questionnaire. Nevertheless, the researcher used questionnaires as the main method of data collection, although interviews and observations were applied as well. Data was then analyzed using the quantitative and descriptive statistics, then presented using tables and pie charts, whereas the quantitative data was coded and data was be entered in SPSS version 22.0 for analysis.

Results and findings

Table 4.01 Response rate

Years worked	Sample size	Response Frequency	Percentage (%)
Line managers	5	3	6.0
Office employee	35	27	54.0
Field employees	10	5	10.0
	50	35	70.0

According to table 4.01 the sample size was 50 so out of the 50 questionnaires its only 15 that were returned. The response was there fore 70 % succesfull.Amongst the respondents 6 % was received from the line managers, whereas 54% was received from the office employees and lastly 10% was received from employees in the field all of whom are in the operations department under containerization.

Characteristics of the respondents

The respondents were all drawn from the Port of Mombasa in Kenya in the operations department which is usually categorized into containerization which mainly deals with containers and the convection cargo operations that mainly deals with loose cargo. The respondents therefore came under the containerization wing both at the office and at the field. The line managers were purposively selected whereas the rest of the employees were mostly selected at random amongst the employees who have worked at the port of Mombasa for more than five years.

Distribution by Number of Years worked in the Organization

Respondents were asked to indicate the number of years they have worked for their organizations as indicated in the figure below.

Table 4.11
Distribution by Number of Years Worked in the Organization

Years worked for organization	Frequency	Percentage (%)	
5-9 years	11	17	
10-15years	18	51	
Over16years	6	32	
		35	100

According to table 4.11 above which sought to obtain the number of years that the respondents have worked at the Mombasa port all being inclusive, 17 % of the respondents have worked at the Mombasa port and more so the operations department for between 5 to 9 years. On the other hand, 51% of the respondents have worked at the Mombasa port for between 10 to 15 years and more so in the operations department, whereas 32% of the respondents have worked at the Mombasa port and more the operations department for more than 16 years.

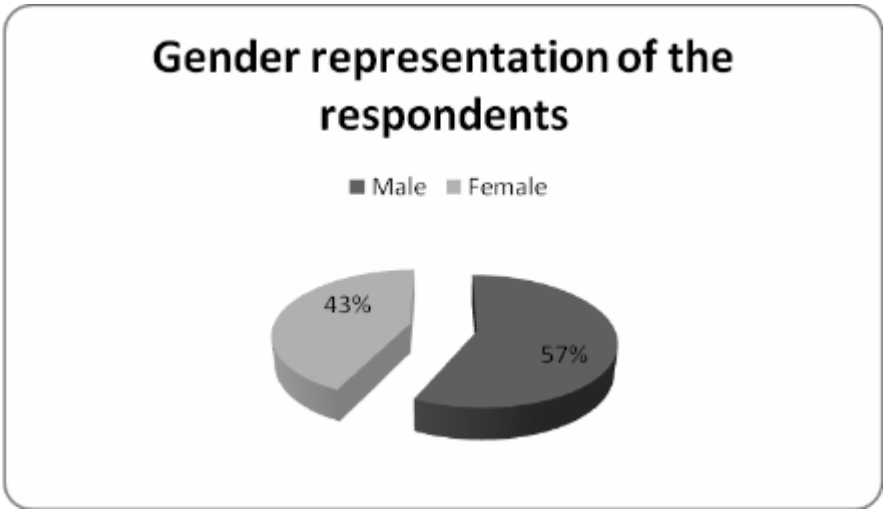


Figure 2: Distribution by Gender
According to figure 2 above, 57 % of the respondents that took part in the research were male by gender; on the other hand 43 % of the respondents were female by gender. This implies that there were more male respondents compared to female respondents.

Table 4.12
Distribution by level of education

Level of Education	Response Frequency	Percentage (%)
Post Graduate 6	18	
Under Graduate	14	40
Diploma	11	31
Certificate	4	11
35	100	

In addition to that, with respect to the level of education in table 4.12, 11% of the respondents were post graduates, whereas 31% of the respondents were undergraduates .40% of the respondents were diploma graduates of whom most had as well enrolled for further studies and the 18% of them were certificate holders inferring that, The majority of the respondents were degree holders, followed by the diploma, then post graduate and lastly the certificate holders.

4.2 Response on E.D.I corporate policies on supply chain performance on cargo distribution management.

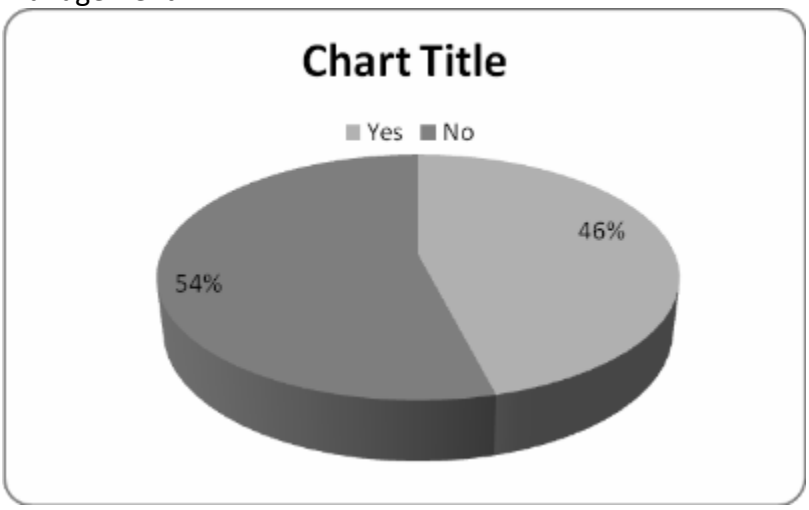


Figure 3: Response on E.D.I corporate policies' performance on timeliness
According to figure 3, above on the response of E.D.I corporate policies' performance on the management of cargo 54 % of the respondents disagreed that the performance of E.D.I

corporate policy on cargo distribution management was satisfactory whereas 46% of the respondents responded by saying yes to the satisfaction of E.D.I corporate policies' performance on cargo distribution management implying that, many requirements of changes in the business processes than expected have got a hand on the performance of E.D.I policies which further brings about difficulty in cooperating with the other trading partners especially the shipping lines and the logistical companies that embrace E.D.I like Maersk in relation to the management of cargo thus affecting performance on timeliness in cargo distribution management.

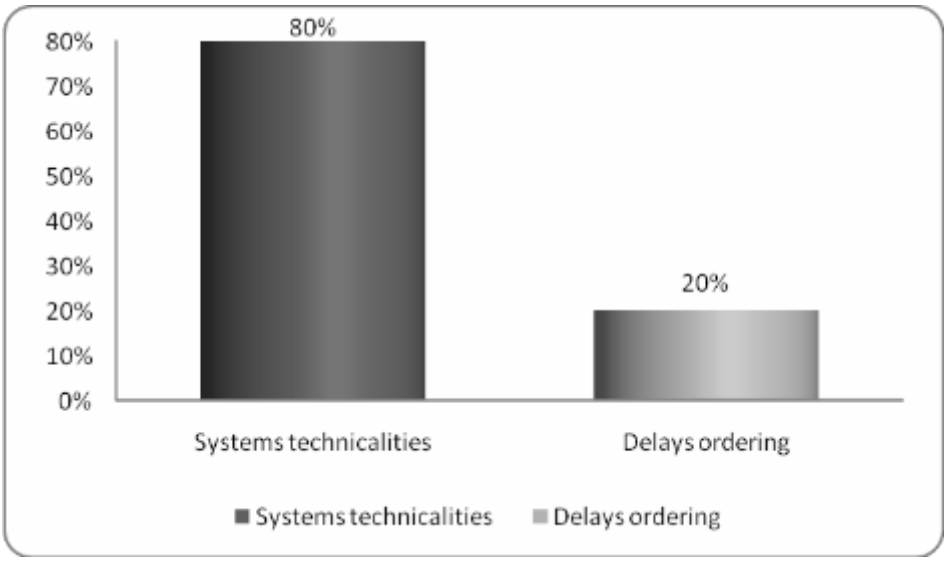


Figure 4: Response on E.D.I corporate policies on time taken to clear cargo

However, according to figure 4 above, in relation to the role of E.D.I corporate policies on delays on the time take to clear cargo, 80% responded that the delays were brought about by system technicalities whereas 20 % of the respondents' feedback was that it was brought about by delayed processing procedures. This therefore established that system technicalities such as the system compatibility problems especially the Simba system of the KRA that is compatible with the E.D.I of KPA when it's low enhance delays.

Table 4.21
E.D.I corporate policies in the timely cargo distribution management

Timely cargo distribution Mgnt	Frequency	Percentage (%)
Excellent	19	54
Fair	11	32
Poor	5	14
	35	100

With respect to table 4.21 above, to rate the adherence of E.D.I policies on delays in the timely management of cargo, 54% of the respondents felt that the adherence to policies were excellent ,whereas 31% felt that they were fair and 14% felt that they were poor. This established that the unforeseeable technical problems especially the hardware and other related technical apparatus.

4.3 Response on E.D.I employee training in cargo distribution management.

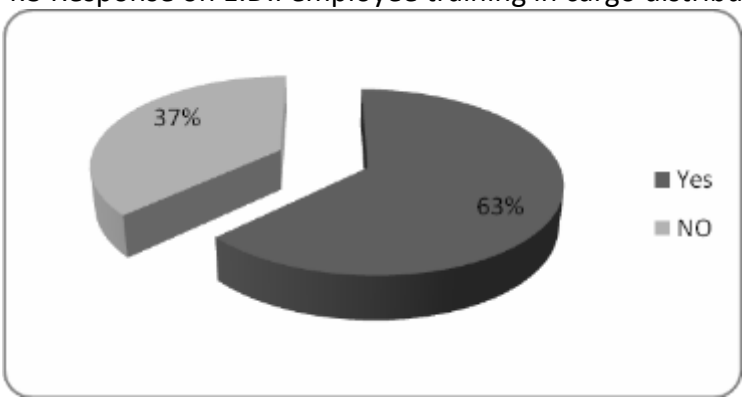


Figure 5: E.D.I training threshold required

According to figure 5, on the threshold of employees' E.D.I training, 63% of the respondents felt that it was up to the threshold required, while 37% of the respondents felt that the employees E.D.I training was not up to the threshold required. This implies that the more the number of years worked and trainings the more qualified and trained is an employees' E.D.I skills thus those with the less years have got lesser skills, training and experience.

Table 4.31:
E.D.I training on improved performance of cargo distribution management.

EDI improved performance	Frequency	Percentage (%)
Positively	19	51
Average	11	43
Negatively	5	6
35	100	

In addition to that, on how the employees' E.D.I training has improved the performance of cargo distribution management on table 4.31, 51% of respondents responded positively while 43% of the respondents gave a response of average, and 6% gave a responded negatively. This established that there's some degree of inadequate E.D.I training in some of the employees and E.D.I stakeholders at large. Nevertheless, when asked how the employees' E.D.I training facilitate the management of cargo, most of the respondents agreed that employees' E.D.I training influence a quick and smooth flow of the process of which is the

cargo distribution management, whereas a few of the respondents felt that employee E.D.I training had a very minimal impact and the entire process in general, in the cargo distribution management. This implies that the level of Education and interpersonal skills among the E.D.I stakeholders plays a great role in relation to employee E.D.I training and the improvement of the cargo distribution management.

4.4 Response on the volume of cargo processing using E.D.I on supply chain performance in cargo distribution management.

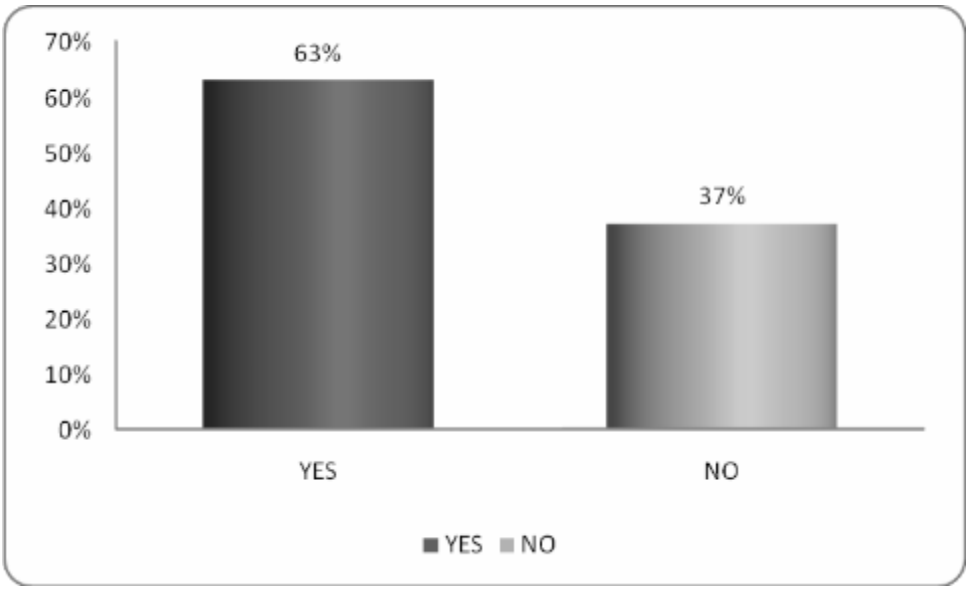


Figure 6: Performance of E.D.I on volume of cargo processing

According to figure 6 above on performance of E.D.I in relation to the increase in cargo volume processing, 63% responded with a yes response that the performance of E.D.I was effective, while 37% of the respondents felt that the performance of E.D.I in relation to cargo volume processing towards the cargo distribution management was not effective. This amplifies lack of flexibility amongst the other trading partners as well as lack of awareness of the benefits of the E.D.I system.

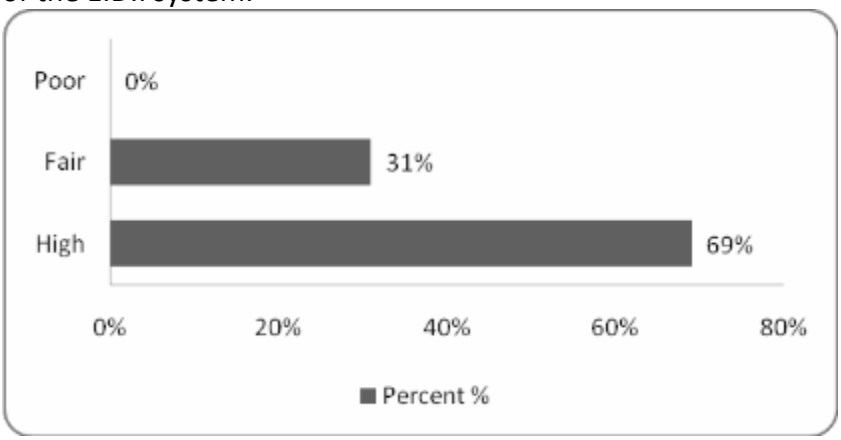


Figure 7: Percentage distribution of improvement in cargo volume clearance with the introduction of E.D.I system.

In relation to figure 7 above with respect to the improvement of cargo volume clearance since the introduction of E.D.I 69 % of the respondents felt that the improvement of cargo clearance since the introduction of E.D.I was high, while 31% of the respondents felt that the improvement of cargo clearance since the introduction of E.D.I was fair and 0% felt that it was poor. This implies that lack of trust of other E.D.I partners due to loss of containers and the lack of adequate legal framework to handle legal disputes associated with the E.D.I influences the results of the improvement of cargo clearance and management since the introduction of E.D.I.

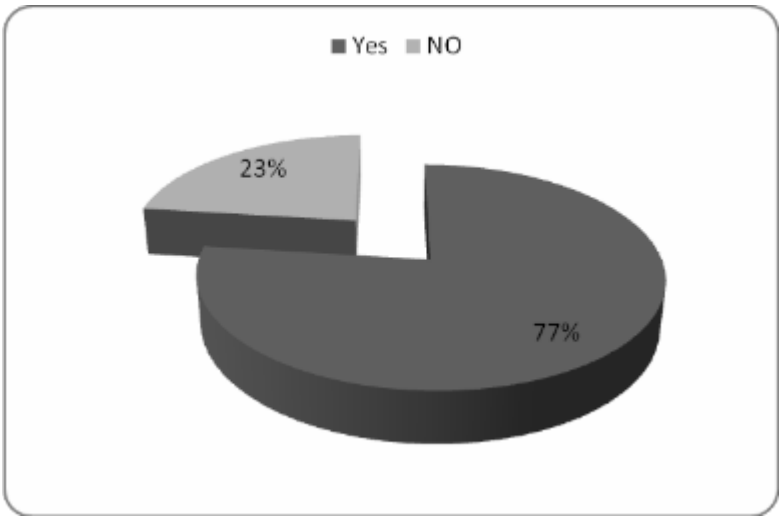


Figure 8: Percentage distribution of performance of E.D.I on volume of cargo payment & clearance

According to figure 8's chart above, 77% of the respondents felt that the performance of E.D.I on the volume of cargo payment and clearance of cargo was a yes, while 23% of the respondents gave a no response since they felt that the performance of E.D.I on the volume of cargo payment and clearance was not good. To inadequate legal framework to handle legal disputes associated with E.D.I.

4.5 Response on employee culture on E.D.I on supply chain performance in the cargo distribution management.

Table 4.51 Employee culture on E.D.I in the cargo distribution management

Employee culture on E.D.I	Frequency	Percentage
Very good	6	17
Good	24	69
Average	5	14
	35	100

According to the table 4.51 above, 17% of the respondents gave a very good response on the employee culture since the inception of the E.D.I system at the port, whereas 69% of the respondents gave a good response on the employees' culture since the inception of E.D.I and 14% gave an average response on the employees' culture since the inception of the E.D.I system. This implies that, the negative employee culture is normally brought about by the fact that, when the system is low, most of them do not bother with system and work but they choose to leave or even stay in a relax mood because at time the delays in the system can take even a whole day.

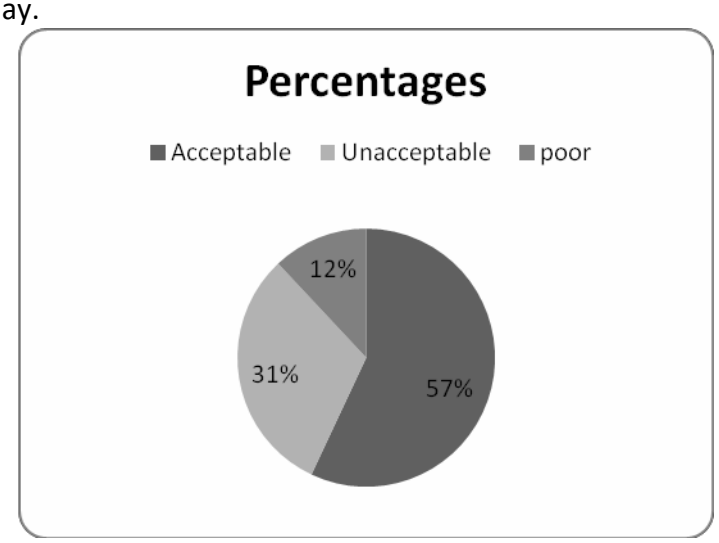


Figure 9: Employee culture on E.DI on time of cargo clearance

According to figure 9 above on the employees' attitude to time in relation to the cargo distribution management, 57% of the respondents felt that the employee culture towards the E.D.I system on time taken to clear cargo with respect to cargo distribution management was acceptable, 31% of the respondents felt that the employee culture towards the E.D.I system on time taken to clear cargo with respect to cargo distribution management was not acceptable and 12% of the respondents felt that the employee culture towards the E.D.I system on time taken to clear cargo with respect to cargo management was poor. This elaborates that unforceable technological problems especially on the servers tend to interfere with the attitude of the employees as well as the time of cargo clearance, payment and management.

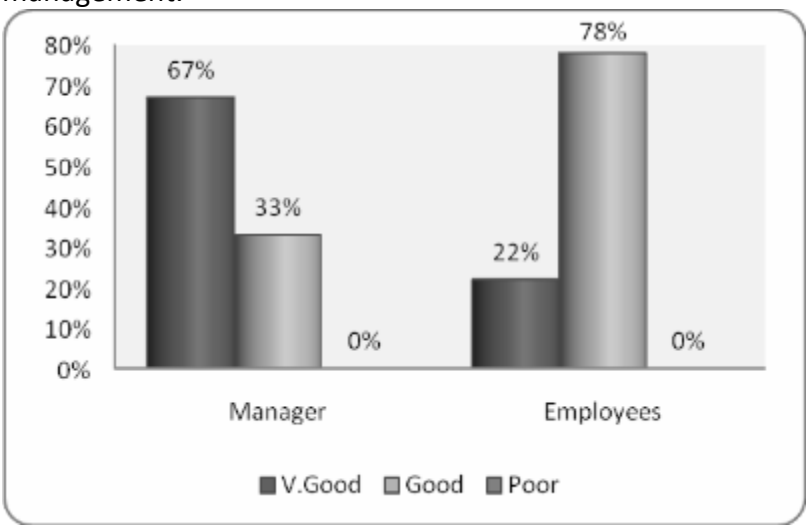


Figure 10: Comments on E.D.I system by line managers and employees.

According to figure 10 above, on comments about the E.D.I system, on the managers' side, the
67% respondents who are line managers responded that it was a very good system, 33% of the line managers responded that it was a good system, and 0% gave a poor response. On the employees' side, 22% of the respondents responded that the E.D.I system was a very good system, while 78% of the respondents felt that it was a very good system and 0% of the respondents felt that it was a poor system. This further implies that despite the fact that there is a lot of support from most employees and the line managers towards the system, there is a high consultancy fee on matters pertaining to the E.D.I system which at times results to lack of top management support is some instances.

Conclusions

From the literature review in this study, it is evident that EDI application plays many roles beneficial to an organization.EDI Technology however, cannot guarantee the success of a business in all conditions. Therefore, a well planned and executed EDI adoption and application process is necessary for the successful adoption of EDI.

i. From the findings above the many requirements of changes in business processes than expected hinders the E.D.I corporate policies in the management of cargo at the Mombasa Port.
ii. Unforeseeable technical problems especially the hardware and other related technical apparatus.
iii. Inadequate legal framework to handle legal disputes associated with E.D.I hinders the volume of cargo using the E.D.I in the cargo distribution management at the Mombasa Port.
iv. When the system is low, the negative the employee culture towards the system and work in general.

Recommendations

This study focused on the Logistical industry only. Whether such results would be consistent in other industries or not, would need to be verified through further research.

i. The IT department of the Mombasa Port as well as that of other stakeholders should be up to date with the current global trends related to E.D.I policies in order to embrace change when necessary.
ii. Adequate checks and balances as well as the overhaul audit of the entire E.D.I system to tame any unpredictability.
iii. Adequate legal framework to handle legal disputes associated with the E.D.I in relation to the management of cargo.
iv. Proper measures to handle the situation especially when the system is low to avoid employees' attitude turning negative and lazy especially during normal working hours.

References

Abubakar, Melati and gengeswari.(2008).Factors influencing the implementation of E.D.I. Journal of information technology volume 11, pp. (55-67).
Africon Universal consulting, (2014).Base line study for Mombasa Port corridor charter. AUC House, Gatundu Road, Kileleshwa, Nairobi, Kenya.

Armstrong, V. and Jackson, D., (1991).Electronic data interchange,: a guide to purchasing and supply, chartered institute of purchasing and supplies.
Elbaz, D. (1998). Electronic data interchange: an assessment of the factors leading to EDI Adoption Concordia University: Masters Thesis.
Government of Kenya, (2009).Integrated National Transport Policy. Government Press, Nairobi.
Hussey R. (1999). Oxford Dictionary of Accounting New Edition, Oxford University Press, Great Britain.
Johnson, G., Scholes, K. and Whinnington, R. (2002). Exploring Corporate Strategy, 6th edition,
Prentice Hall, India.
Joost Platje, (2013) Physical infrastructure and logistics from the perspective of transaction cost
economics. Central and eastern European journal of management and economics. Vol 1 No 1 pp. (35-46).
Kenya Ports Authority, (December 2011). Customer Service Charter. Mombasa. Kenya Ports Authority. (June, 2010).Special focus Edition no. 2. Mombasa.
Kenya: Issues in trade logistics (2005). http://siteresources.worldbank.org/INTTLF/Resources.
Kilindini Waterfront Project (2006). "Kilindini Waterfront and Terminal Operating System".Available at http://www.kwatos.kpa.co.ke.
Killen, K. H and Kamauff, J.W. (1995).Managing Purchasing, Irwin, New york.
Korir, W. (2013). An analysis of performance of container freight stations in the Port of
Mombasa. International Journal of Advance Research, Vol. 1 (10), pp. (731 – 738).
Kothari, C.R. (2008). Research Methodology, Methods and techniques. New Delhi. New Age
International (P) Ltd Publishers, India.
Lysons .K. and Farrington B, (2002).Purchasing and Supply Chain Management, 5th Edition, Pearson Education Limited, London.
Lysons .K. and Farrington, B. (2012).Purchasing and Supply Chain Management, 8th Edition, Pearson Education Limited, London.
Michael .A. (2006).Armstrong's Handbook of human resource management.Prentice Hall, India. Mintzberg, H., Ahlastrand, B. And Lampel, J. (1998).Strategy Safari.Prentice Hall, India.
Mombasa Port Corridor Charter, March 2014.
Monczka, R.M and Carter, J.R. (1998).Implementing of electronic data interchange, Journal of purchasing and supply chain management,summer.Vol 2, pp. (257-268).
Mrkonjic, R. (2009).What is E.D.I and how does it work .Vantage Point and Associates, Inc. Toronto.
Mugenda, M, O. and Mugenda, G. (1999).Research Methods Qualitative and Quantitative Analysis, Acts Press, Nairobi, Kenya.
Mugenda, O., &Mugenda, A. (2003) Research Methods: Qualitative and Quantitative Approaches. Nairobi: Africa Centre for Technology Studies.
Noor Apandi Osnin. (2003). E.D.I in Transportation.Center for ocean law and policy, Maritime Institute of Malaysia.
Oxford Students Dictionary.(2002).Oxford University Press, Great Britain.

Peterson,O.Magutu, Joel,K.Lelei, and Ali, O.Nanjira, (2010).The benefits and challenges of E.D.I implementation and application at Kilindini Water Front Project in Kenya. African journal of business management. Volume 1 pp. (212-236).
Philip, A., Joshua, A. and Oluwagbemi, O. (2011).Development of a window based system for E.D.I. Journal of Computer Science and Engineering, volume 7, pp. (68-77).
Richard B., Chase, F. Robert, J. and Nicholas, J. (2006).Operations Management for Competitive
Advantage 11th edition, McGraw Hill, New York.
Rodgers, et al. (2004).Complex adaptive systems and diffusion of innovations.Public sector innovationjournal, Volume 10(3) Article 30.
Rogers, E.M.(2004). Diffusion of Innovations, Fourth Edition; New York Free Press.

Samuel Monday Nyema, (2014).Factors influencing container terminal efficiency: A case study of Mombasa Port. European journal of logistics purchasing and supply chain management.Vol 2 No 3 pp. (39-78).
Torrington, D. and Hall, L. (1991).Personal Management, Prentice Hall, India. Total soft bank (2007).Available at http://www.tsb.co.kr/
Vogt J.J., P ienaar W.J, De Witt P.W.C. (2002). Business Logistics Management, Oxford University Press, South Africa. Website: www.kpa.co.ke.2013
Wong, Q. (2003). Marketing Research, Reed Education Professional Worbunk, London. World Bank, (2010).Special Focus-The Port of Mombasa. World Bank, Washington D.C Zhang,Q.,Vonderembse, M.A., Lim,J.S.,(2002).Value chain flexibility: dichotomy of competence
and capability. International Journal of Production Research40 (3),pp. (561-58