THE IMPACT OF INFORMATION COMMUNICATION TECHNOLOGY ON INVENTORY CONTROL SYSTEMS IN TRANSPORT ORGANIZATION: A CASE STUDY OF KENYA FERRY SERVICES

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ABSTRACT: *With the increasing focus in enhancing supply management chain through use of the rapid development of Information and Communication Technology, businesses are seeking to develop and organize strategic, efficient and world-wide inventory control system for its use. In order to promote such global inventory control system, which are also compatible with sustainability objectives, organizations need to develop and implement effective systems both individually and collectively. This has resulted to Modern inventory control as a result of improved technology being one of the most strategic initiative embraced by organization in partnering initiatives for encouraging collaboration and information sharing among trading partners (Angulo, 2007). The main objective of the study was to investigate the impact of technology on inventory control systems in Kenya ferry services. The study adopted a descriptive research with survey of a total of 220 and applied a stratified random sampling technique to select a sample size of 60 respondents. Questionnaires were used as the main data collection Descriptive statistics analysis method was to analyze the gathered data. The study concluded that technology has had bigger impact on inventory control in terms of efficiency, ease of accessing information and accuracy thereby affecting organizational performance. The study recommends that modern inventory control systems should be well implemented since it forms a platform for ease of evaluating risk in which the organization invest a lot of money in purchasing of inventory. Additionally the study recommends that organization should integrate all its inventory management functions with information communication technology as well*.

KEYWORDS: **ICT, Integration, Efficiency, Inventory, Supplier, Procurement**

INTRODUCTION

Background of the study

In today's business environment, even small and mid-sized businesses have come to rely on computerized inventory management systems. Certainly, there are plenty of small retail outlets, manufacturers and other businesses that continue to rely on manual means of inventory tracking. Indeed, for some small businesses like convenience stores, shoe stores, or nurseries, purchase of an electronic inventory tracking system might constitute a wasteful use of financial resources. But for other firms operating in industries that feature high volume turnover of raw materials and/or finished products, computerized tracking systems have emerged as a key component of business strategies aimed at increasing productivity and maintaining competitiveness. Moreover, the recent development of powerful computer programs capable of addressing a wide variety of

record keeping needs—including inventory control—in one integrated system have also contributed to the growing popularity of electronic inventory control options.

Given such developments, it is little wonder that business experts commonly cite inventory control as a vital element that can spell the difference between success and failure in today's keenly competitive business.

Statement of the Problem

Organizations in transport sector and all others that handle different inventories has been facing inventory problems in the past, organization that were carrying hundreds or even thousands of different parts of items were faced with the impossible task of physically monitoring the inventory levels of each part.While every organization is undoubtedly unique each with its own set of purchasing, inventory, order fulfillment, tracking systems and pick-and-pack procedures, the importance an integrated software system plays in streamlining the tailored data within each warehouse cannot be underestimated, Using IT solutions to automate an organization inventory processes optimizes efficiencies and improves access to information across every aspect of a logistics enterprise.

Research Objectives
General Objective

The objective of the study was to assess the impact of information communication technology on inventory systems in the transport organization.

Specific Objectives

However, the study will specifically seek to:
1. To identify the effect of Kenya Ferry services strategic ICT initiative on Inventory control implementation.
2. To examine the effect of internal integration on inventory control implementation in key Kenya Ferry Services.
3. To understand the effect of external integration on inventory control implementation in Kenya Ferry Services
4. To examine the effect of technological integration on inventory control implementation in Kenya Ferry services.

Research Questions

1. What is the effect of strategic ICT initiative on implementation of inventory in Kenya Ferry Services?
1.   What is the effect of internal integration on inventory implementation in Kenya Ferry Services?
2.   What is the impact of external integration on e-procurement implementation in Kenya Ferry Services?
3.   What is the effect of technological integration on e-procurement implementation in Kenya Ferry Services?

Hypothesis

H1: Kenya Ferry service is implementing strategic ICT initiative on Inventory control.

H2: Internal integration affects inventory control implementation in key Kenya Ferry Services.

H3: External integration affects inventory control implementation in Kenya Ferry Services

H4: Technological integration affect inventory control implementation in Kenya Ferry services.

Significance of the study

The research is important to the following stakeholders of Kenya Ferry Services.

1. Employees who if the recommendations are implemented will be able to adopt the new system and improve their performance due to better systems which will be less cumbersome and reliable.

2. Kenya Ferry Service management who will be able to make better decisions that will help improve service delivery and win customers confidence hence propel the company to higher heights in growth, this will be possible by observing reliable inventory reports that will be provided.

3. Shareholders who will be able to earn a return on their investments this is because revenue will increase with reduction in breakdown but increase in number of ferry users who in return raises the company revenue base.

4. The government and the public who will benefit from efficient services, accurate reports to the ministry on ferry activities quarterly.

Scope of the Study

The study was carried out within Kenya Ferry Services. The study focus was a sample of four major sections within Kenya ferry services which happen to be more involved in usage of inventory and they include the following, maintenance, operations, Finance and procurement department.

Limitation of the Study

Like similar studies, current study is not without limitations. This includes data collection time and the unwillingness of respondents to participate. Respondents in senior positions posed the greatest challenge as they were unwilling to participate, citing lack of time to fill the questionnaire hence hampering the expected response rate.

The topic of study also posed a challenge as most people did not understand the inventory control concept and the (ICT) hence mostly relying on the people on procurement department and those who had gained knowledge in the area through the course of their studies.

LITERATURE REVIEW

In various service providing companies and organizations worldwide, Information and Communication Technologies (ICTs) play a role in the process of providing effectively efficient services, products and packages to better satisfy their customers. Companies face a dilemma in today's competitive marketplace, where on one hand, customers demand customised products and services and require that their orders are filled quickly, but on the other hand they do not want to pay a premium for this customization and availability (Graman and Magazine, 2006). Therefore, organizations are exploring ways toward postponement strategy in response to constantly changing demands (Yang et al.(2004).

Need of processes and procedures, adequate planning, time issues, and management support have also been identified as strategic challenges in inventory control implementation. Challenges

related to internal integration that has been brought up in previous literature are the need for commitment from senior management and organization-wide communication of this commitment, budgeting and costs, change management, as well as need of training and resources. With respect to external integration, issues related to change management were found to be most challenging. As for technological integration, data quality, system-to-system integration, and ICT/technical issues have been identified as major challenges for many organizations when implementing inventory control, AOT Consulting (2003).

Strategic ICT initiative on Inventory control implementation.
As technology alone does not ensure successful adoption, the success of a public sector inventory control initiative depends on users and buyers making use of the new process and system. The solution must attract end users to view inventory system as the preferred means by which to purchase, store and supply goods and services (KPMG, 2001). The success of the project also depends on communication to the users (Birks, Bond, & Radford, 2001). According to the CGEC (2002), the two major obstacles to increasing support among users are their level of technological awareness and acceptance, and their willingness to change long-established internal business processes. Wanke and Zinn (2004, p.466) states that inventory management approaches are a "function of product, operational and demand related variables such as delivery time, obsolescence, coefficient of variation of sales and inventory turnover" and that logistics managers are more likely to decentralize inventory in order to stock product close to the customer's facility if the customers demand a reduced delivery time.

Internal integration on inventory control implementation
As focus in inventory control system integration, to ensure informed judgments respondents should be fully knowledgeable about the inventory function and its performance, both before and after the implementation. Procurement and store managers are usually the most knowledgeable when it comes to the key performance metrics and the impact of inventory control. The findings suggest that the satisfactory acceptance of the inventory system by the employees can be contributed to a constellation of organizational, technological, and procurement vendor related factors (Birks *et al*., 2001). Most importantly, vendor support was found to influence employee acceptance of inventory systems through its indirect influence in establishing stability of the system and preparation of customized training program for the council employees in close collaboration with the procurement and stores manager. Study identifies internal integration effect on inventory was it enables connection of employees with a single process and also result in risking large investments of time and money, without absolute certainty that its full potential will be achieved every time. Other studies found out that it enhances organization ability to implement "just in time" strategy and has challenges in getting collective commitment although it enables better information flow between buyers and supplier Gifford, A. (2003). Other cite difficulties in securing sufficient budget allocations and employees lack of sufficient knowledge leads to additional cost in training .

External integration on inventory control implementation
Organizations implementing ICT focused inventory systems are concerned with the level of acceptance of the system both by the internal users and the suppliers. The effects of external integration on inventory control implementation have been associated with Employee resistance

to change and adopt the new system while it streamlines supply chain by removal of inefficient intermediaries. Other researchers found out that there was a possibility of encountering hiccups of implementation due to lack of information from the technology provider when new versions of the system are launched, and also difficulties in engaging suppliers in the process - especially smaller organizations - given the level of investment expected Gifford, A. (2003). Despite this external integration has enabled removal of market barriers like lead time, accuracy and efficiency but Implementation experience slow progress due to lack of a standardized government system and lack of commitment from senior management.

On the other hand, without adequate participation by suppliers, users have no incentive to use the inventory system. In particular, the presence of automatic routing of purchase orders to appropriate managers for approval, access to e-catalogues, sending purchase orders to suppliers, producing expense report capabilities encourages staff to accept and use the system without much hesitation (Doesburg, (2003

Technological integration on inventory control implementation

A key objective of technology in moving to inventory control is to consolidate and leverage organizational spending power and to rationalize supplier relationships. This is achieved by centralizing the procurement information and control, while giving the flexibility to end-users to find the product and supplier that best match their needs. Recent procurement strategies focus on restructuring the entire order-to-delivery process rather than on specific tasks. It is very important to determine the level of integration required between the inventory control solution and existing information systems (KPMG, 2001).
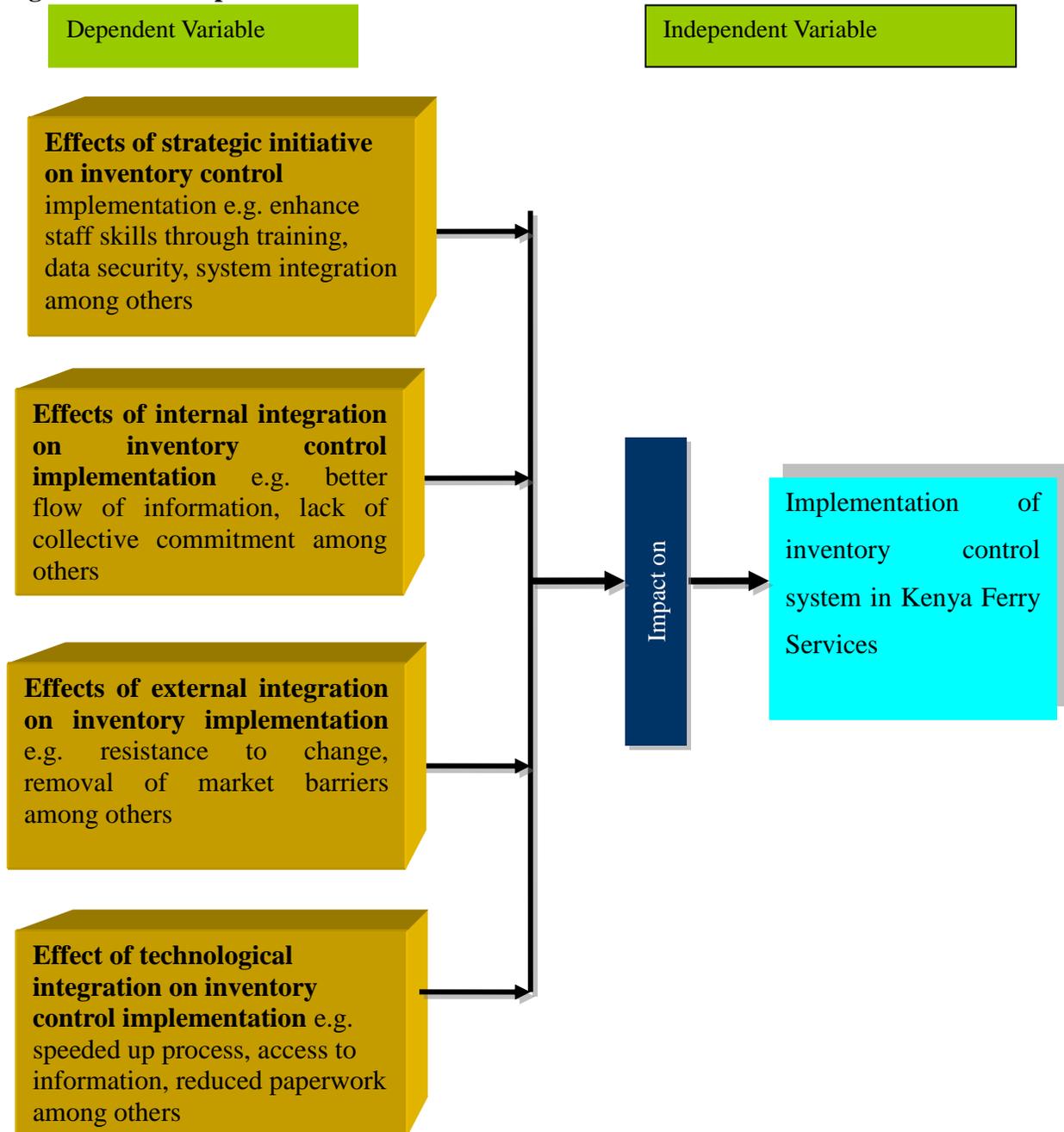
A recent study conducted by Forrester Research indicates that U.S. manufacturers are increasingly dependent on the benefits brought about by IT/ICT to: improve supply chain agility, reduce cycle time, achieve higher efficiency and deliver products to customers in a timely manner (Fasanghari et al., (2008). Grover et al., (2002), suggest that the decision to use ICT within the inventory control could encourage the commitment of establishing relational behaviour. Sweeney, (2005) emphasizes on how Inventory Management (IM) has gained increasing prominence in recent years. Inventory Management is an approach which is being viewed by organizations and companies in many sectors as a key source of competitive advantage. Sweeney, (2005) defines inventory management and outlines the role of Information and Communication Technology (ICT) as a key enabler of the process.

CONCEPTUAL FRAMEWORK

there have been some academic studies conducted on the value of Business to Business (B2B) inventory control (Subramaniam & Shaw, 2002), the e-Commerce procurement process (Yen & Ng, 2003), the classification of inventory transactional structures (Croom & Brandon-Jones, 2004), and the impact of inventory control on buyer-seller relationships (Carr & Smeltzer, 2002), there appear to be relatively few detailed empirical studies on Impact of ICT on inventory control (Croom & Brandon-Jones, 2004). Building on the traditional IOS implementations, inventory control research has included a variety of constructs and measures in understanding and predicting implementation success.

The overall conceptual model for this study presented below (Figure 2.1), emphasizes the effects of strategic initiatives, internal integration, external integration and technological integration on implementation of inventory control in public entities.

Figure 2:1: Conceptual Framework

Dependent Variable

Independent Variable

Effects of strategic initiative on inventory control implementation e.g. enhance staff skills through training, data security, system integration among others

Effects of internal integration on inventory control implementation e.g. better flow of information, lack of collective commitment among others

Effects of external integration on inventory implementation e.g. resistance to change, removal of market barriers among others

Effect of technological integration on inventory control implementation e.g. speeded up process, access to information, reduced paperwork among others

Impact on

Implementation of inventory control system in Kenya Ferry Services

METHODOLOGY

This chapter presents the research design and explains the methodology used in gathering data. The study will be conducted within Kenya ferry Services amongst the company employees, the study will be exploratory in nature, using a case study research design. A case study involves a careful and complete examination of a social unit, institution, organization family, cultural group or an entire community and embraces depth of a study. In this case the study will involve a service providing organization (Kenya Ferry Services).

Research Design

A descriptive research design was used in this study. Gay (1983) defines descriptive research as the process of collecting data in order to test hypothesis or to answer questions concerning the current status of the subjects in study. The purpose of this type of study was to determine and report the way things are (Mugenda 2003). This design is considered appropriate in this study since it describes what is happening at present and the researchers only report what is the impact of technology on inventory management at Kenya ferry Services.

Target Population

The total employee population of KFS is 61; in conducting the research the researcher will concentrate on a sample of 21 employees/
The study will be carried out in Kenya Ferry Services Headquarters' in Mombasa and it will be composed of company's staff and procurement customers.

Table 1: Target Population at Kenya Ferry Services. (Employees)

Category	Frequency	Percentage
Top management	5	8.3%
Mid-level	10	16.7%
Junior level	19	30%
Subordinates	27	45%
Total	61	100%

Source: Researchers 2014

Sampling Design

According to Mugenda (1999), for any meaningful and representative research, a sample of at least 10% is representative enough. In this study, Stratified random procedure will be employed so as to obtain 4 strata of the top management, middle level management, junior level and subordinate staff. Sample of 10% will be taken from the top management, middle level management a 20% sample will be taken, 30% sample from the junior and 50% sample of subordinate staff. Systematic random sampling will be used to identify the respondents of the study. This sampling procedure ensures equal chance of every item in the population to be chosen for research (Cooper and Schindler, 2004).This method enables researchers to obtain samples that are representative of the sample. This saves time, money and gives the researcher precise solution and answers in short time. This is because purposive method is appropriate to get customers of Kenya Ferry Services.

Table 2: Sample Size (Employees)

Category	Frequency	Sample size	Sample Percentage
Top management	5	1	10%
Mid-level	10	2	20%
Junior level	18	5	30%
Subordinates	27	13	50%
Total	60	21	100%

Source: Researcher 2014

Data Collection Procedures

The procedure to be used to collect data will include questionnaires which will be distributed to the respondents and time will be given to them to complete them. Follow-ups will also be made to ensure success of the procedure.

The main tool will be questionnaires which will consist of both open-ended and closed-ended questions. Secondary data will also be used for it is very crucial to determine issues concerning the variable relation the study intends to obtain from Kenya Ferry services.

Instrumentation

This research will use questionnaires to gather primary data, questionnaire will be taken to various employees and customers of Kenya Ferry services for them to fill, and this questionnaire will be left with the respondent to be collected later. This method is economical in terms of time and cost and thus will be able to cover a large area.

Data Analysis Procedure

All data collected will be checked for completeness, coded and tabulated. It will then be analyzed using ms excel to generate descriptive statistics which enable the researcher to draw conclusions and inferences drawn from the sample results to the population. Quantitative data will be used to represent the results in the form of graphs, charts and tables according to the objectives and research questions of the study

DATA ANALYSIS AND PRESENTATION

This chapter presents the results of the data collected and further discusses these findings. It is divided into quantitative and qualitative analysis corresponding with the sections found in the questionnaires. The tables and figures in this chapter are derived from the findings of the study.

Permission to do the research was obtained from the various KFS employees. Thereafter, managers of the various providers were approached for permission to conduct the research. In all cases, access was granted without much questioning and the respondents were also approached to fill in questionnaire. The participants who did not have enough time out of work were allowed to complete the questionnaire at home.

The instrument used in the research was pre-tested to improve their validity and reliability basing on the objectives of the study. Questionnaires were edited as soon as they were received to

ensure completeness. Filling in questionnaires was voluntary and participants were assured of anonymity and confidentiality.

Data Analysis

Preliminary analysis procedures of cleaning, frequencies, consistency checks, and debugging were done on the data obtained. This further improved the quality of the data collected. Further and detailed analysis was done using discriminant analysis. Of all the 21 questionnaires given out only one was not returned, thus the analysis was done using 20 questionnaires received from the respondents. The next section shows the results.

Results and Findings

The results are presented beginning with the presentation of sample characteristics as shown in Table 3.

Table 3: Demographic Information about the Sample-Gender (N=20)

Factors	Category	Frequency	%
Gender	Male	14	60
	Female	6	40

Table 3 indicates that 40% of the respondents were female while 60 % were male.
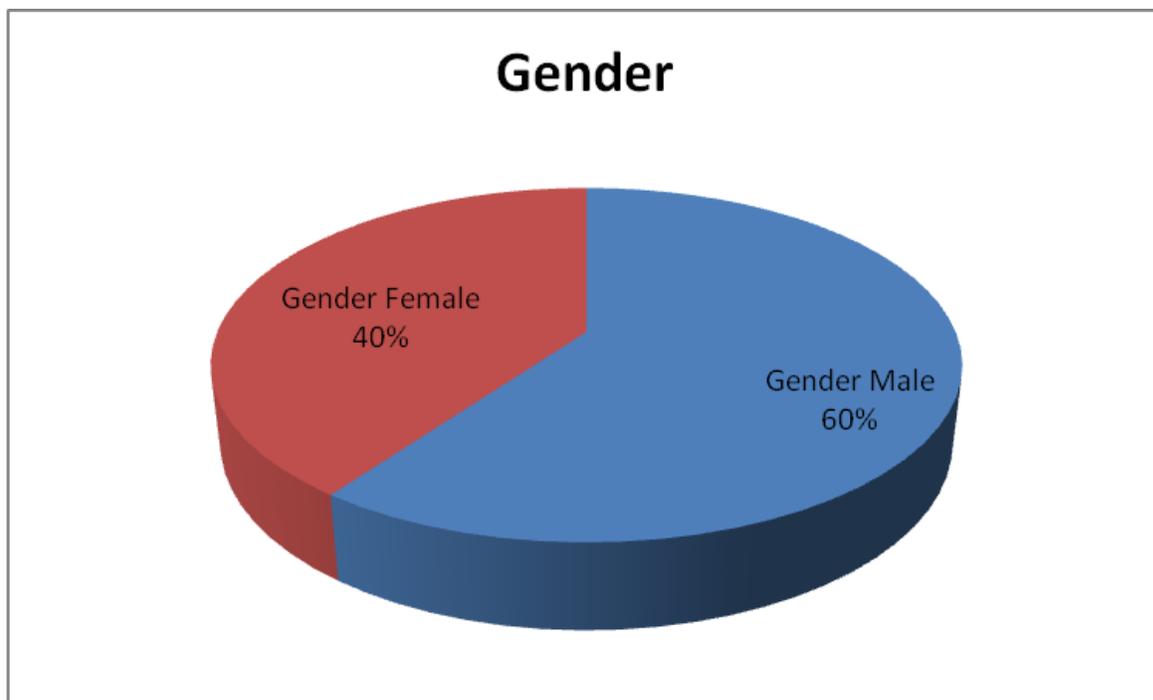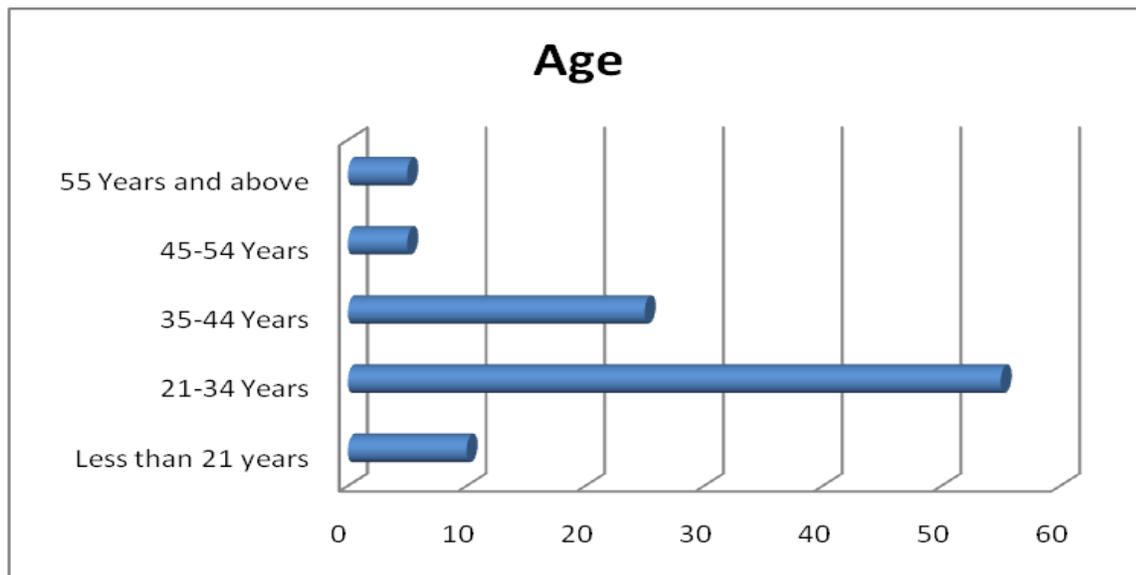

Figure 2: Demographic Information about the Sample-Gender
Source: researcher 2014

Table 4: Demographic Information about the Sample (Age) (N=20)

Factors	Category	Frequency	% response
Age	Less than 21 years	2	10
	21-34 Years	11	55
	35-44 Years	5	25
	45-54 Years	1	5
	55 Years and above	1	5
	Not indicated	0	0

Table 4 indicates that on the age of respondents 10% were less than 21 years at the time of the study, 55% between the ages of 21-34 years old, 10% were 35-44 years old while 10% were at the age of 45 years and above.
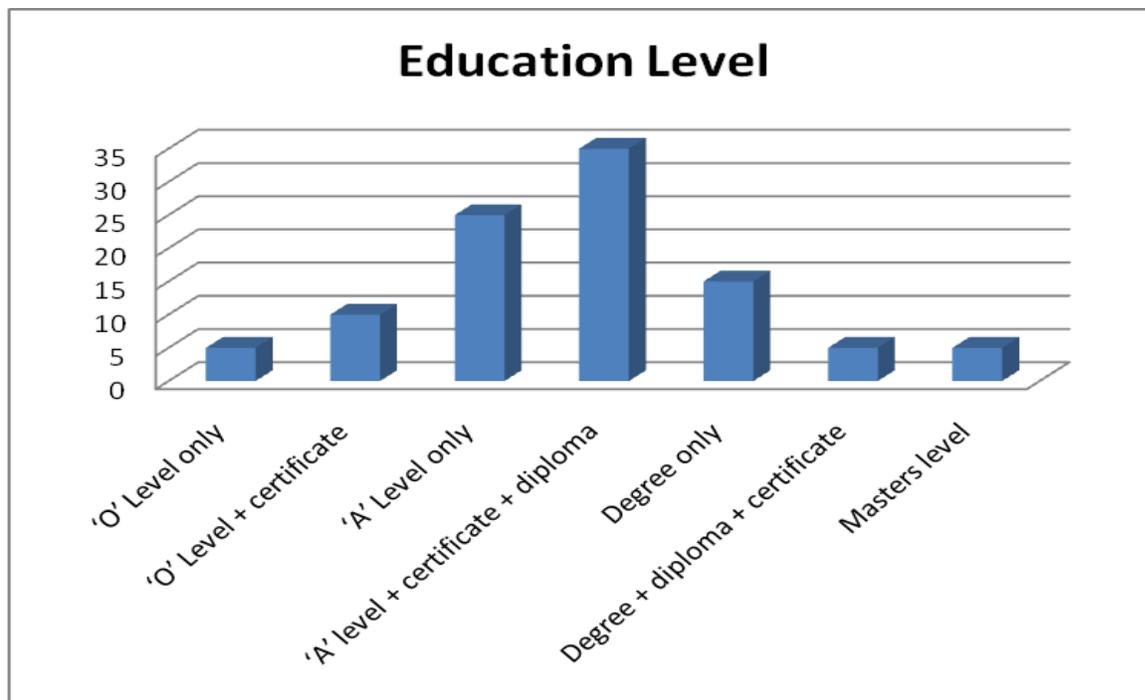

Figure3: Demographic Information about the Sample (Age)
Source: Researcher 2014

Table 5: Demographic Information about the Sample (Level of education) (N=20)

Factors	Category	Frequency	%
Education	Primary school	0	0
	'O' Level only	1	5
	'O' Level + certificate	2	10
	'A' Level only	5	25
	'A' level + certificate + diploma	7	35
	Degree only	3	15
	Degree + diploma + certificate	1	5
	Masters level	1	5

Table 5 indicates that all the respondents had gone beyond primary level of Education, 5% 'O' Level only, 10% 'O' Level + Certificate while 80% from A' level to Masters level
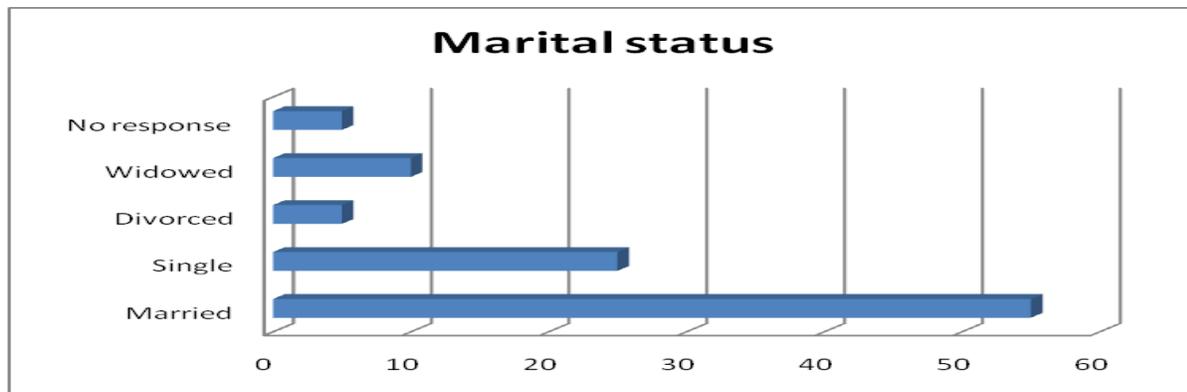

Figure 4: Demographic Information about the Sample (Level of education)
Source : Researcher 2014

Table 6: Demographic Information about the Sample (Marital status) (N=20)

Factors	Category	Frequency	%
Marital status	Married	11	55
	Single	5	25
	Divorced	1	5
	Widowed	2	10
	No response	1	5

Table 6 indicates that 55% of the respondents were married, 25 % single, 5% divorced, 10% were widowed while 5 did not indicate their marital status.


Figure 5: Demographic Information about the Sample (Marital status)
Source : Researcher 2014

Table 7: Duration of being using the inventory control system at Kenya Ferry Services (N=40)

Factors	Category	Frequency	%
Seniority	Less or equal to 6 months	4	10
	1-2 years	16	40
	More than 2 years	20	50
	Not indicated	0	0

Table 7 indicates that 10% of the respondents had been using the inventory control system with the organization for a period of less or equal to 6 months, 40% between 1-2 years, 50% for more than 2 years.
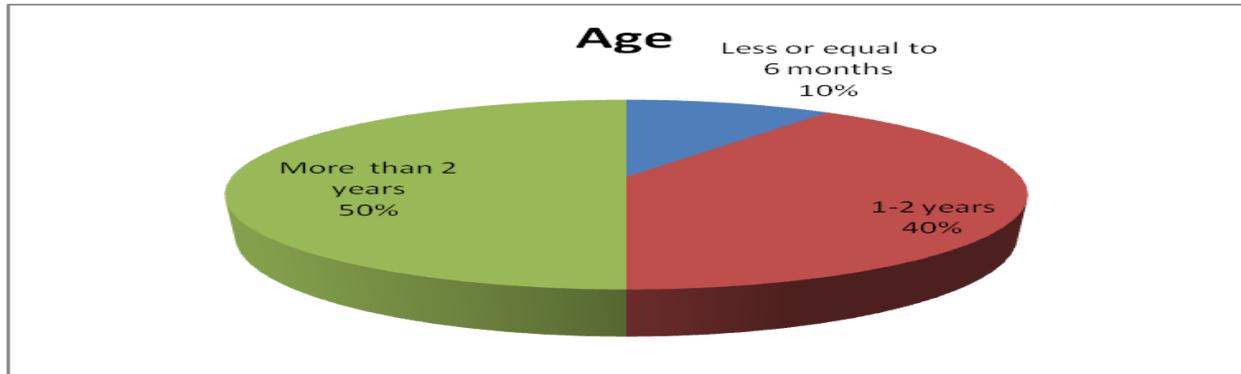

Figure 6: Duration of being an employee at Kenya Ferry services
Source : Researcher 2014

Table 8: Feedback on items purchased and tracked through inventory control in the organization (N=20)

Statement	Great extent	Some extent	Average	Little extent	No extent
Office supplies	30	50	10	10	0
Expendable items related to healthcare	25	20	30	25	0
Furniture and electrical items	30	20	40	10	
Telecom services	10	15	30	10	35
Computer hardware and software	40	30	10	20	0
Fuel	50	20	30	0	0

Table 8 indicates that 80% of the respondents agreed that most items bought and tracked through E-procurement were Office supplies, 45 % expendable items related to health care, 50% furniture, 25% Telecom services and 70% computer Hardware/ software and fuel respectively.
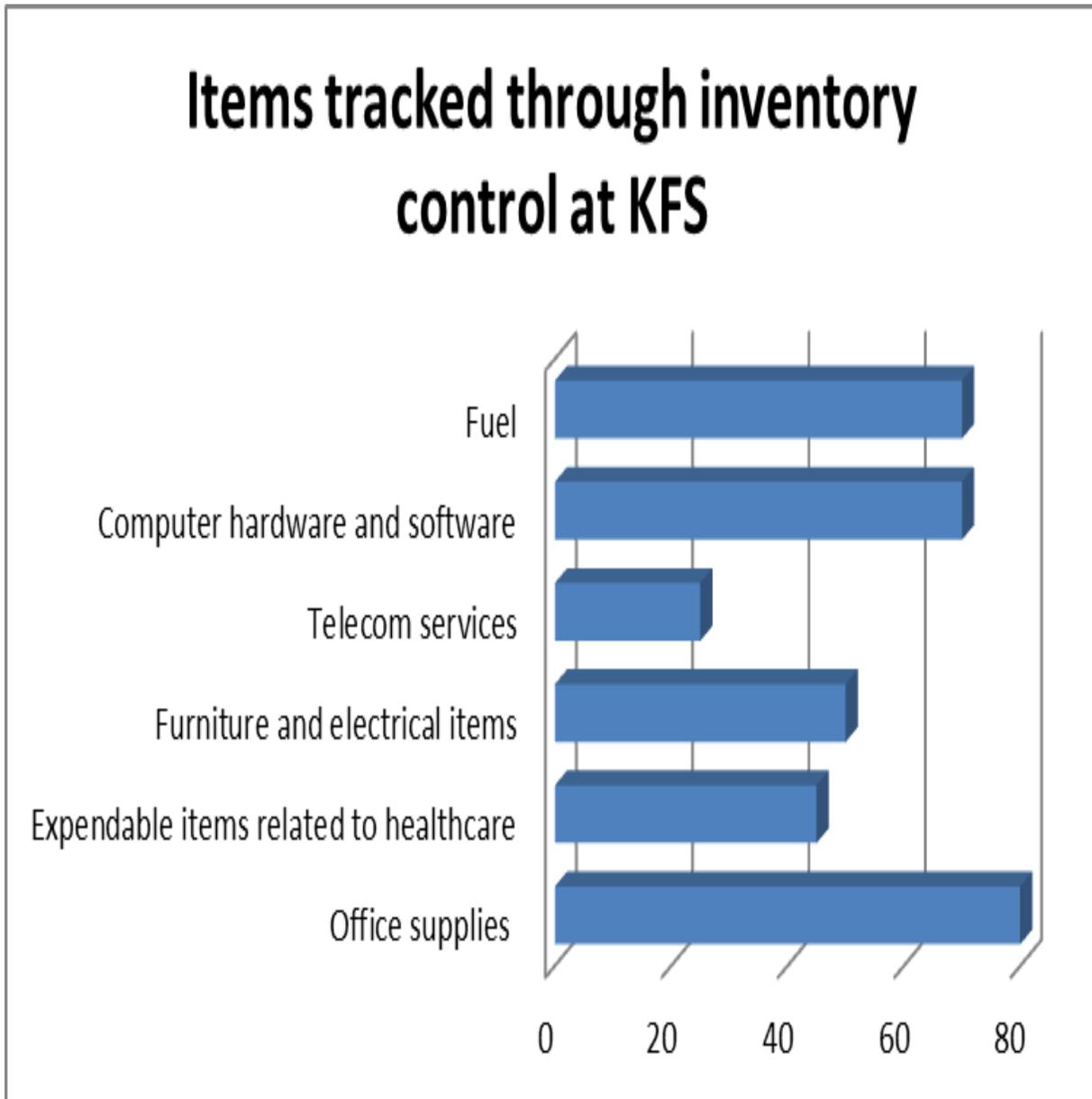
Figure 7: Feedback of items purchased and tracked through E-procurement in the organization
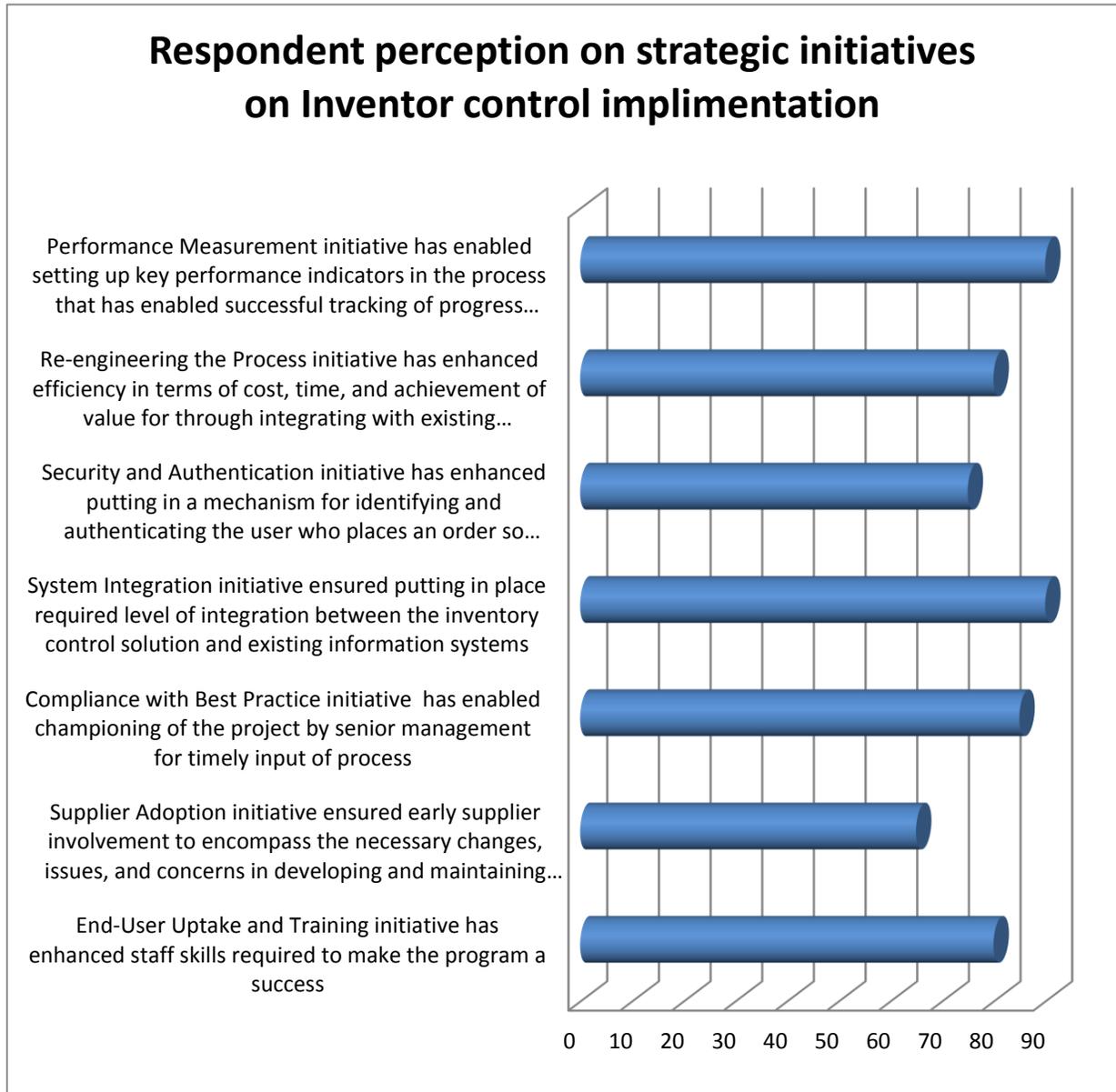**Source: Researcher 2014**

SECTION B: STRATEGIC INITIATIVES ON IMPLEMENTATION OF INVENTORY CONTROL IMPLIMENTATION

Table 9: Respondents feedback on effects of strategic initiatives on Inventory control implimentation (N=20)

Statement	%
End-User Uptake and Training initiative has enhanced staff skills required to make the program a success	**80**
Supplier Adoption initiative ensured early supplier involvement to encompass the necessary changes, issues, and concerns in developing and maintaining supplier catalogues	65
Compliance with Best Practice initiative has enabled championing of the project by senior management for timely input of process	85
System Integration initiative ensured putting in place required level of integration between the inventory control solution and existing information systems	90
Security and Authentication initiative has enhanced putting in a mechanism for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order.	75
Re-engineering the Process initiative has enhanced efficiency in terms of cost, time, and achievement of value for through integrating with existing purchasing processes	80
Performance Measurement initiative has enabled setting up key performance indicators in the process that has enabled successful tracking of progress towards set goals throughout the project.	90
Top Management Support initiative has enabled successful implementation of the program through streamlining it to encompass the vision and goals and commitment for change to suit the purpose intended	60

Table 9 indicates that on the effect of strategic initiatives on inventory control implimentation 80% of the respondents felt that End-User Uptake and Training initiative has enhanced staff skills required to make the program a success, 65% felt Supplier Adoption initiative ensured early supplier involvement to encompass the necessary changes, issues, and concerns in developing and maintaining supplier catalogues, 85% agreed that Compliance with Best Practice initiative has enabled championing of the project by senior management for timely input of process , 90% felt that System Integration initiative ensured putting in place required level of integration between the inventory control solution and existing information systems, 75% felt that Security and Authentication initiative has enhanced putting in a mechanism for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order, 80% agreed that Re-engineering the Process initiative has enhanced efficiency in terms of cost, time, and achievement of value for through integrating with existing purchasing processes, 90% felt that Performance Measurement initiative has enabled setting up key performance indicators in the process that has enabled successful tracking of progress towards set goals throughout the project while 60% agreed that Top Management Support initiative has enabled successful implementation of the program through streamlining it to encompass the vision and goals and commitment for change to suit the purpose intended
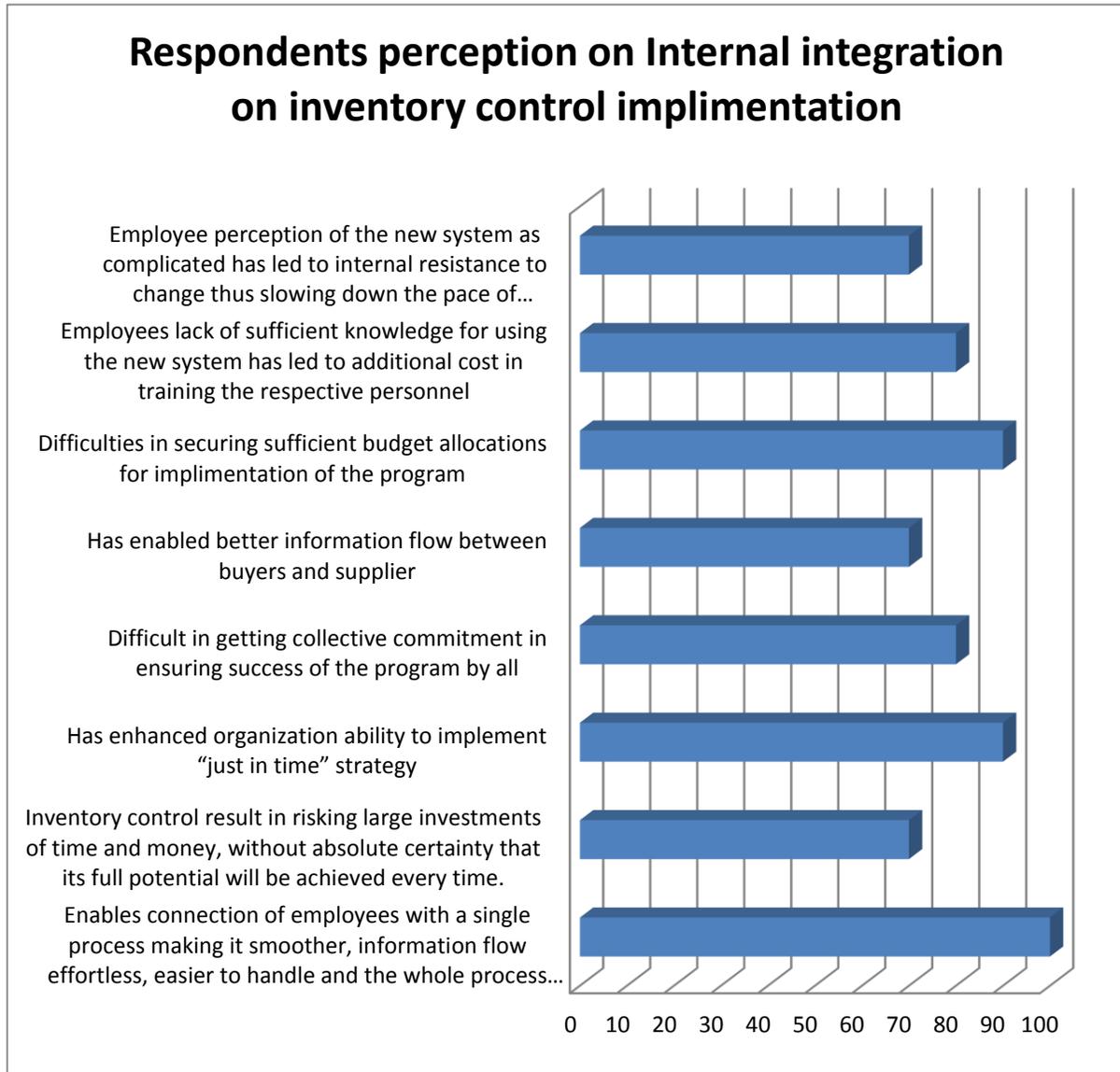
Figure 8: Respondents feedback on effects of strategic initiatives on inventory control implementation
Source: Researcher 2014

SECTION C: EFFECTS OF INTERNAL INTEGRATION ON INVENTORY CONTROL IMPLIMENTATION

Table 10: Respondents feedback on effects of internal integration on inventory control implementation (N=20)

Statement	Great extent	Some extent	Average	Little extent	No extent
Enables connection of employees with a single process making it smoother, information flow effortless, easier to handle and the whole process is streamlined	20	80	0	0	0
Inventory control result in risking large investments of time and money, without absolute certainty that its full potential will be achieved every time.	30	40	30	0	0
Has enhanced organization ability to implement "just in time" strategy	60	30	10	0	0
Difficult in getting collective commitment in ensuring success of the program by all	40	40	10	0	10
Has enabled better information flow between buyers and supplier	40	30	10	10	10
Difficulties in securing sufficient budget allocations for implimentation of the program	40	50	10	0	0
Employees lack of sufficient knowledge for using the new system has led to additional cost in training the respective personnel	40	40	10	10	0
Employee perception of the new system as complicated has led to internal resistance to change thus slowing down the pace of implimentation	40	30	10	20	0

Table 10 indicates that on the effect of internal integration on inventory control implimentation all the respondents felt that it Enables connection of employees with a single process making it smoother, information flow effortless, easier to handle and the whole process is streamlined, 70% felt that E-procurement result in risking large investments of time and money, without absolute certainty that its full potential will be achieved every time, 90% agreed it Has enhanced organization ability to implement "just in time" strategy,80% agreed that it experienced difficult in getting collective commitment in ensuring success of the program by all, 70% felt it Has enabled better information flow between buyers and supplier, 90% felt it has met some difficulties in securing sufficient budget allocations for implimentation of the program, 80% agreed that due to employees lack of sufficient knowledge for using the new system has led to additional cost in training the respective personnel while 70% felt that Employee perception of the new system as complicated has led to internal resistance to change thus slowing down the pace of implementation
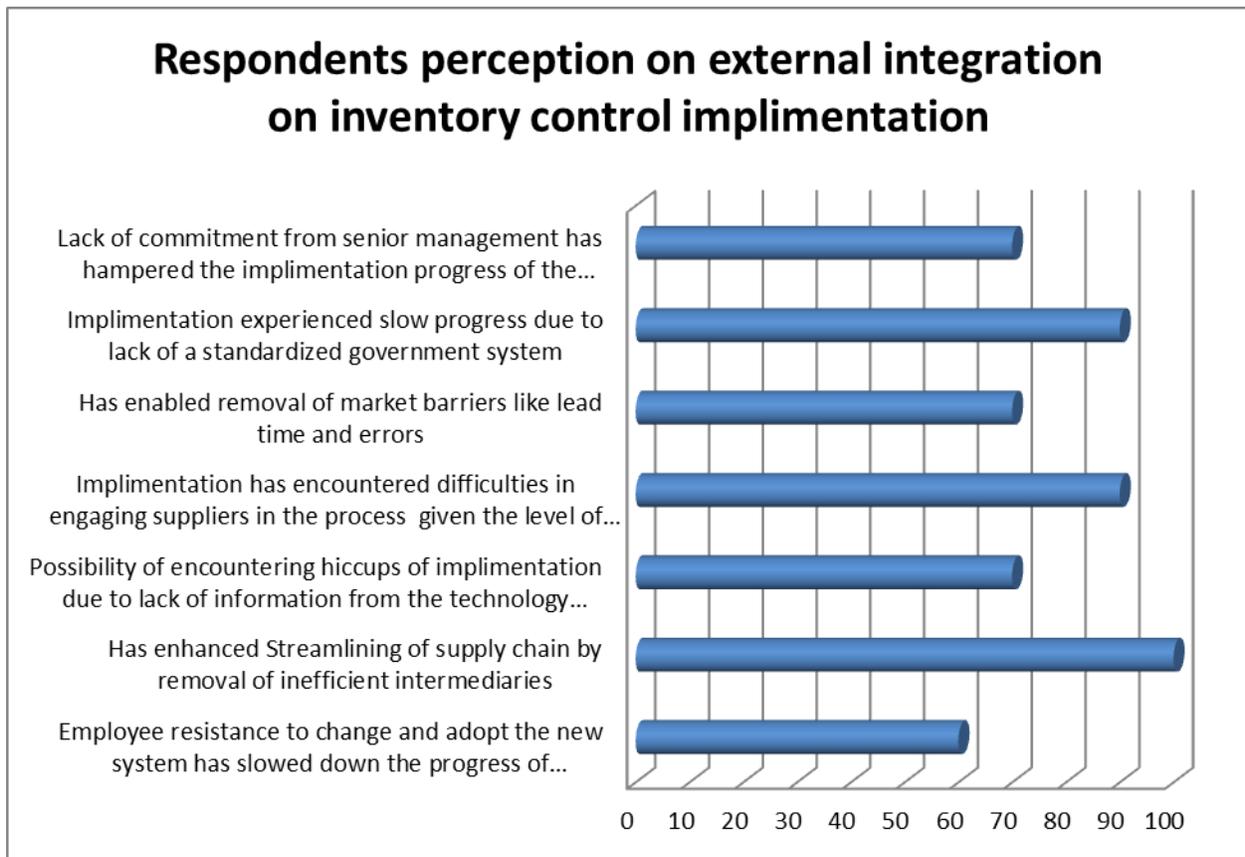
Figure 9: Respondents view on measures to overcome bottlenecks in inventory control implementation
Source: Researcher 2014

SECTION C: EFFECTS OF EXTERNAL INTEGRATION ON INVENTORY CONTROL IMPLIMENTATION

Table 11: Respondents feedback on effects of external integration on inventory control implementation (N=20)

Statement	Great extent	Some extent	Average	Little extent	No extent
Employee resistance to change and adopt the new system has slowed down the progress of implementation	30	30	20	10	10
Has enhanced Streamlining of supply chain by removal of inefficient intermediaries	90	10	0	0	0
Possibility of encountering hiccups of implimentation due to lack of information from the technology provider when new versions of the system are launched	40	30	20	10	0
Implimentation has encountered difficulties in engaging suppliers in the process - especially smaller organizations - given the level of investment expected in terms of providing catalogue information to buyers, and marketplaces using different technologies, platforms and business languages	40	50	10	0	0
Has enabled removal of market barriers like lead time and errors	40	30	20	10	0
Implimentation experienced slow progress due to lack of a standardized government system	50	40	10	0	0
Lack of commitment from senior management has hampered the implimentation progress of the program	30	40	20	10	0

Table 11 indicates that on the effects of external integration on inventory control implimentation 60% of the respondents felt that Employee resistance to change and adopt the new system slowed down the progress of implimentation; all felt that it has enhanced Streamlining of supply chain by removal of inefficient intermediaries, 70% agreed that there was a possibility of encountering hiccups of implimentation due to lack of information from the technology provider when new versions of the system are launched, 90% felt that the Implimentation has encountered difficulties in engaging suppliers in the process - especially smaller organizations - given the level of investment expected,70% agreed that it Has enabled removal of market barriers like lead time and errors, 90% agreed that Implimentation experienced slow progress due to lack of a standardized government system while 70% of the respondents felt that lack of commitment from senior management has hampered the implimentation progress of the program

Figure 10: Respondents feedback on effects of external integration on inventory control implementation
Source : Researcher 2014

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This study examined factors associated with implementation of inventory control in KFS. Since there are several dimensions to the measurement of impact of ICT on inventory control in Kenyan Government entities like Kenya Ferry services depending on the availability of data, it looked at the effects of strategic initiatives, internal, external and technological integration on E-procurement implementation. Inventory control system solutions do not always require additional technology, dedicated personnel or staffing resources. Rather, existing technology infrastructure, including equipment and computers with network connectivity can be used. Inventory control and related technologies promise major improvements in the management of procurement, supplies management chain. These improvements are achieved by sliming the supply chain and by acting on (or perhaps creating) markets at either end of that chain. Also, buyers and sellers are able to share information in real time to build specification that add value to resulting product and build strong relations. The impact of the increase in centralization on the operational and strategic measures will be an interesting issue to address in future research

Strategic initiative in inventory control system implimentation

A noteworthy finding of this study is that firms' structural characteristics play a significant part in what effect inventory control has on their sourcing strategies. On the issue of strategic initiatives effect on inventory control in the organization majority of the respondents felt that End-User Uptake and Training initiative had effectively enhanced staff skills required to make the program a success. This was interlinked with System Integration initiative ensured putting in place required level of integration between the inventory control solution and existing information systems which the employees were familiar with. The need for compliance with Best Practice initiative had enabled championing of the project by senior management for timely input of process which necessitated participative decision making in developing the system through Supplier Adoption initiative ensured early supplier involvement to encompass the necessary changes, issues, and concerns in developing and maintaining supplier catalogues. The system being prone to internet fraud Security and Authentication initiative had enhanced putting in a mechanism for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order. To ensure smooth transition of the system from old transition re-engineering the Process initiative had enhanced efficiency in terms of cost, time, and achievement of value for through integrating with existing purchasing processes. This was necessitated through performance Measurement initiative has enabled setting up key performance indicators in the process that has enabled successful tracking of progress towards set goals throughout the project. The research found out that top Management Support initiative has enabled successful implementation of the program through streamlining it to encompass the vision and goals and commitment for change to suit the purpose intended.

The inventory control market is still evolving with the development of technology and new models to serve the needs of the market. The majorities are taking a "wait and see" approach (strategy). These companies are either aware of the developments, but not committing resources or investing selectively until the best inventory control model can be identified. These companies do not perceive the current state of development merits shifting their established inventory control process to the business world; never the less, they are active in experiments and widespread. The strategy reflects active experimentation but no sizeable investment until the best inventory control model is defined. A smaller set of organizations adopt a more passive strategy of observation without experimentation. Their adequacy (and risk) will depend on how quickly organizational learning can be absorbed without creating the "absorptive capacities" that the wait and see companies seem to be developing. A moderate number of organisations are taking aggressive strategy, stating that they are adopting inventory control technology declaring that they are 'investing significantly to gain a competitive lead or moving 'fast into inventory control solutions. This strategy however is defined as riskier in the absence of any well-defined solution and companies may end up betting on the wrong technology.

Internal integration on inventory control implimentation

On the effect of internal integration on inventory control implimentation in organizations, Cost saving has been identified as the main motivator for them to implement inventory control. It is easy to speak about cost benefits compared to other benefits as its effect can be seen immediately in companies' savings. The results of the research indicate that although internal integration inventory control result in risking large investments of time and money, without absolute

certainty that its full potential will be achieved every time, it enables connection of employees with a single process making it smoother, information flow effortless, easier to handle and the whole process is streamlined. Majority of the respondents agreed that it has enhanced organization ability to implement "just in time" strategy despite experiencing difficult in getting collective commitment in ensuring success of the program by all Difficulties in securing sufficient budget allocations for implimentation of the program. Internal integration has enabled better information flow between buyers and supplier. Challenges found were that employees' lack of sufficient knowledge for using the new system has led to additional cost in training the respective personnel while employee perception of the new system as complicated has led to internal resistance to change thus slowing down the pace of implementation

According to the outcome of this study at Kenya Ferry services, it can be concluded that process efficiency is not just about less paper work and fewer mistakes, but reduction of suppliers used for the inventory control process before implementation of inventory control solution. It stresses that inventory control can lead to professionalism in work, better business control and cleans up the processes within the organization. It indicates an agreement regarding the benefit of better information flow between buyers and suppliers. Some of the main points worth mentioning are increase in number of transactions, transparency in process, standardization of best practice and increases in responsiveness to customers. The results showed that cost benefit was the main driver for companies to implement inventory control system. Other benefits included were transparency and visibility across process, better internal and external relations and streamlined buying process. The problems of implementation and integration of existing infrastructure and security and control risks were holding back companies from wide usage of inventory control. But most of all, lack of managerial commitment hinders the adoption process. Company's needs were the deciding factor for the kind of approach they will follow regarding the adoption of inventory control and emergence of a new approach.

External integration on inventory control implimentation
A relation between better information flow and saving from investments and generation of revenue were also acknowledged. A consensus between the respondents was documented that employee resistance to change and adopt the new system has slowed down the progress of implimentation. Despite this the results of the study indicate that external integration has enhanced Streamlining of supply chain by removal of inefficient intermediaries although there was a possibility of encountering hiccups of implimentation due to lack of information from the technology provider when new versions of the system are launched. Majority felt that the implimentation has encountered difficulties in engaging suppliers in the process - especially smaller organizations - given the level of investment expected in terms of providing catalogue information to buyers, and marketplaces using different technologies, platforms and business languages. Despite it having been able to remove market barriers like lead time and errors, Implimentation experienced slow progress due to lack of a standardized government system and lack of commitment from senior management has hampered the implimentation progress of the program.

The strategic measure that is most impacted by inventory control is user satisfaction. Given that the users have been dealing with inefficient and cumbersome manual systems at Kenya Ferry

services, inventory control has definitely made their purchasing easier. An interesting finding from this study is that **ICTs -** information and communication technologies)
e procurement has resulted in an increase in purchase centralization for most organization.

Technological integration on inventory control implimentation
Electronic inventory control enables companies to use markets more efficiently, as it lowers search and evaluation costs and gives access to a larger number of potential suppliers. However, the impact of electronic inventory control on the number of suppliers is subject to asset specificity, product complexity and the necessity for relationship specific investments. The study found out that the technological integration on inventory control implimentation has simplified and speeded up the buying process to make it more efficient apart from reducing cost of operational purchasing activities e.g. ordering, expediting and requisitioning. It had also increased compliance with procurement laws and regulations while reducing cost of tactical inventory control activities e.g. formulating specification, selecting suppliers, negotiating with suppliers, contracting and disposals among others. It had also led to better access to information and transparency in markets through a simplified, standardized, purchasing process. The study also indicate it has led to reduced paperwork and enabled online reporting and reduced Cost of strategic inventory control and procurement activities – e.g., spend analysis, transaction analysis, market analysis, planning, developing purchasing policies among others. The study also indicate due to technological shortcomings in that the process has become more complex and requires increased employee knowledge and has eventually lead to exclusion of suppliers lacking electronic capabilities. Despite this it has enabled possibility of evaluating a larger number of suppliers capacity and also high cost of control through centralization of the procurement process, which involve fewer individuals in the purchasing process.

CRITIQUE AND SUGGESTIONS FOR FURTHER RESEARCH

Some problems hindered the validity of these findings. The first criticism concerns the problems with the self-report, in general. These can be flouted with biases. Inclusion of objective measures data records and performance reports in subsequent performance related researches is recommended.

The timing of measures is also important t. This is because inventory control impact has short and long term impacts. The effects of electronic inventory control obtained depend on when the measurements were taken. For this research on inventory control only the short and medium term effects were obtained since the aspect of electronic inventory control it was still a new concept in the country at the time of study. So a time series design is much better for the long term effects of E procurement

Another constraint is that generalization of present findings is limited to Kenya Ferry services or government entities. Inventory control is also implemented by other organizations all over the world. Research focusing on inventory control in private entities is recommended.

Another constraint was that more time was needed to get the required information from the sample. Getting access in some employees and departments is sometimes difficult depending on

subject of the study. Researches undertaken during implementation stage of such schemes like Electronic inventory control are likely to be resented because employees mistake them as evaluation tools from competitors. They thought the data collected would be used against them in some way. This is understandable because electronic inventory control is a new thing and at the time this research was undertaken, it was still at their initial stage of implementing it. Detailed explanation about the importance of research, assurance of anonymity and confidentiality were given. Rejections and non-response are likely to be high and it was lucky that only 1 out of the 21 questionnaires were not returned in this study.

Present research gave a limited consideration to the objectives of inventory control. To widen the scope, further research should consider whether the objective of reducing costs has been met.

CONCLUSION

Inventory control is significant for all the stakeholders. It has different meanings to the various stakeholders. Investing in inventory control can be a harm or loss, threat or challenge. Harm or loss would concern the organizations which loses customers prematurely due to competition. Threat refers to potential harm or loss. This can be seen in the light of the organizations which remain. Some will remain under fear of future customer lose. Challenge refers to opportunities for growth, masterly or gain. Inventory control therefore, is both an opportunity and challenge to organizational development and to the stakeholders. It is challenging to plan, implement and manage inventory control and its effects. However, inventory control offers an opportunity to enhance effectiveness and gain competitive edge in service delivery. This stimulates organizational growth and development.

Inventory control has different outcomes depending on the timing, that is, whether the short term or long term impacts are the ones in question. The long-term effects will be realized only if a supportive organizational culture develops. Therefore, a follow-up study on the development of organizational culture in the Kenya Ferry Services Entities is recommended. This will show if a new culture favorable of higher organizational performance has been created.

RECOMMENDATIONS

In order to give the growing trends of Information and Communication Technology (ICT) which involves embracing inventory control in organizations, the following strategies are recommended for further follow up:

The organization must be focused in terms of their needs and using the right technology to achieve goals, rather, than acquiring technology of inventory control because other organizations have it.

Government participation in ensuring focused telecommunication industry must be visible to reduce or remove avoidable costs of implementing inventory control.

Training and Manpower development is another major problem militating against the growth of inventory control in the country. Government must make right IT policy by ensuring that Computer, Communication equipment and other IT infrastructures to a large extent are manufactured in the country so that its people can acquire first hand necessary skills. Government Policy that will guide against fraud and Security risks posed by inventory control is inevitable.

To counter the legal threat and security posed to Electronic inventory control, the necessary legal codes backing the transactions must be established; this will enhance the growth of this technology venture.

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