IMPACT OF INTEGRATED LOGISTICS SYSTEM ON EFFECTIVE MANAGEMENT OF INVENTORY IN ELECTRICITY SUB-SECTOR IN KENYA

BY

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

This study attempted to evaluate the perceived and factual impact of integrated logistics system (ILS) on effective management of inventory in electricity sub-sector (ESS) in Kenya. The specific concern of the study revolve around understanding resultant business economic benefits (BEB) for the sector in terms of improved customer service, reduce costs and cycle time as occasioned by quality ILS management practice, ILS resource activation level and ILS capability levels. The framework is informed by resource based view to influence BEBs in the ESS. Descriptive research using survey method was applied. The target population consisted of ESS staff in management who use ILS. They were purposively sampled and their opinion sought by use of IS-Impact Measurement Model. Primary data were collected through a questionnaire. Both quantitative and qualitative techniques were used to analyse data. Statistical tests done included correlation ANOVA and regression analysis. The scientific research method was consistently employed to assure quality control while observing ethical standards. The SPSS tool was used in data analysis. The study suggests quality management practice and resource activation level are significant indicators of BEB, that ILS has played a vital role to improve quality of customer service, achieve stock cost reduction and reduce cycle time in the operations of the ESS. This may accrue business economic benefits in terms of enhanced return on investment (ROI), improved business practices by relative reduction in stock holding, improved decision making triggering increased electricity connectivity and achievement of set targets. The results will inform government, ESS and corporate managers on the impact of ILS on managing inventory. It is vital to improve capability level on both quality customer service and cost reduction, also improve resource activation level on cost reduction

Key words: Integrated Logistics Systems (ILS), Inventory Management, Business Economic Benefits (BEB), Quality Management Practice (QMP), Information technology (IT).

ACKNOWLEDGEMENT

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DEDICATION

To my loving wife Nancy Wangui Njau, my son Moses Waweru Njau and my daughter Grace Nyokabi Njau for their love, support and encouragement. As husband and father respectively, i wish to be exemplary to them, by God's grace

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ACRONYMS AND ABBREVIATIONS

BEB:	Business Economic Benefits
BPs:	Business Processes
CLM:	Council of Logistics Management
COFEK:	Consumer Federation of Kenya
CSCMP:	Council of Supply Chain Management Professionals
CT:	Communication Technology
D&M:	De Lone and McLean
DCS:	Design and Construction System
ERP:	Enterprise Resource Planning
ESS:	Electricity Sub-Sector in Kenya
FRACAS:	Failure Reporting And Correction Action System
GDP:	Gross Domestic Produce
IFS:	Integrated Financial Systems
ILS:	Integrated Logistics System
ISO:	International Standards Organization
IT/IS:	Information Technology/ Information Systems
JIT:	Just In Time
KenGen:	Kenya Electricity Generating Company Ltd
KETRACO:	Kenya Transmission Company Ltd
KNBS:	Kenya National Bureau of Statistics
KP:	Kenya Power Limited, brand name
KPLC:	Kenya Power & Lighting Company Ltd
LAN:	Local Area Network
LPI:	Logistics Performance Index
MI:	Management Information
MM:	Material Management
PPOA:	Public Procurement Oversight Authority
QMP:	Quality Management Practice
REC:	Rural Electrification Commission
ROI:	Return On Investment
SAP:	Systems, Applications and Products in Data Processing
SCM:	Supply Chain Management
SPSS:	Statistical Package for Social Scientists
TCA:	Total Cost Analysis
TQC:	Total Quality Control
WBCSD:	World Business Council for Sustainable Development

DEFINITION OF TERMS

Enterprise Resource Planning (ERP) – The technique and concepts for integrated management of business as a whole from the viewpoint of the effective use of management resources to improve efficiency of enterprise management.

Customer – Those employees and third party contractors who use the services of the warehouses.

Cycle Time – The time that passes between the beginning and the completion of a given recurring process.

Integrated Logistics System (ILS) - An IS/IT based ERP Systems ideal for material/inventory management. Also referred to as SAP Material Management (MM) software.

Inventory - An idle resource of any kind that has potential economic value and considered as locked up capital.

Inventory Management - Is about specifying the size and placement of stocked materials/goods/ required at a particular location within the ESS warehouses to protect the regular and planned course of production against the random disturbance of running out of materials/goods. Time, uncertainty and economies of scale come into play here to achieve optimality.

Lean Logistics - A new approach to effective management of inventory to achieve speed, flow and eliminate waste in the distribution centres.

Logistics – That part of Supply Chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption in order to meet customer's requirements.

Logistics Performance Index - A World Bank comprehensive multi-dimensional index created to help countries identify challenges and opportunities they face in trade

logistics performance. Rated on scales of one (worst) to five (best), done by the WB every two years. It uses six factors; efficiency, quality ease, competence, ability and frequency, World bank, (2012).

System - A set or assemblage of things connected, associated, or interdependent, so as to form a complex unity.

Total Quality Management - A holistic approach to long-term success that views continuous improvement in all aspects of an organization as a process and not as a short-term goal. It aims to radically transform the organization through progressive changes in the attitudes, practices, structures, and systems.

CHAPTER ONE

INTRODUCTION

1.1   Background to the Study

Globalization and the resulting increased competition have made many organizations the world over to quickly embrace information and communication technology in their day-to-day business processes. This thy do with the aim of reducing the costs of logistics and decreasing the risks related to logistics activities (Malone & Crowston, 1991). New Technology is one of the tools that have been used with a great degree of success especially in the developed world. However, of necessity is the constant question, how useful is this new technology to us this far?

Logistics was a non-entity before 1900 but gained attention since world-war II. By the end of the 19th century, logistics interest and impact was phenomenal. With a whole century of development, we now find many authors who recognize Information Technology (IT) as a means to enhance Integrated Logistics Systems (ILS) competitiveness. Research puts a very strong case for systems integration and its positive relationship to organizational success. IT is one of the few productivity tools that is increasing in capability and simultaneously decreasing in cost. While there is evidence that logistics Information Systems (IS) capabilities result in world class performance, it is also true that there are numerous examples where logistics IS extensions have wasted firm resources, Popo & Christine, (2001). Still, in others cases, profits are eroded because of failure to examine functional areas where cost savings might otherwise have been realized, Popo & Christine, (2001).

Many countries such as the Asian Tigers have used Strategic Logistic Management to improve their strategic position for competitive advantage. (Bowersox & Cross 1996, Bowersox & Daugherty, 1995, Christopher, 1994, Sum, Teo, and Ng, 2001). However,

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empirical studies examining the relationship between integrated logistics and effective performance are few.

The dynamics of IT/IS, particularly its evolution and innovations appear to be very fast and fragile and requires constant evaluation. The emerging globalization trends result to sophisticated customers whose demands require a highly integrated market. As organizations leverage on integrating logistics, governments integrate the logistics processes to impact the gross domestic product (GDP), rate of inflation, interest rates, productivity, energy costs and services availability. According to CSCMP, 2012, in 2011, US spent 8.5% of its GDP on logistics.

Investment in logistics is high. For instance, US spent US$920 Billion in 1999 on logistics. This was: 10 times more on logistics as was in advertising; twice the amount spent on national defence and equal to that spent on medical care, CSCMP, (2012). Chiang (2008), confirms continuous evaluation as fundamental. Key issues to evaluate include: determining cost; measuring efficiency; ensuring quality and customer satisfaction measure. However, there has been little quantitative evidence that relates LIS capabilities and characteristics to logistics impact, (Closs, Goldsby & Clinton, 1997).

Scholars and management experts globally agree that in strategic logistics management, true integration has been achieved when both total cost analysis (TCA) and total quality control (TQC) merge both within each firm and between the set of firms comprising a distribution channel (Daugherty, Ellinger, & Gustin, 1996; Kenderdine & Larson, 1988; Mahesh, Ranjit & Sridhar 2008, 2008; Sumantri & Lau 2011). However, a fundamental question that deserves critical examination is whether the integration results in meeting specific customer needs.

Major factors underlying the development and interest in Integrated Logistics Management include: globalization; new markets; greater production efficiencies; tap

technological competencies; fall of trade barriers and advent of advanced telecommunication technologies. The development of the systems approach and total cost analysis approach; recognition of logistics role in the firms customer service programme; profits leveraging resulting from increased logistics efficiency and recognition that logistics can help create a competitive advantage in the market place.

World Bank report on global logistics performance acknowledged a competitive network of global logistics as the backbone of international trade and that efficient integration of logistics for trade and growth is vital. "Trade logistics matter". However, a large logistics gap between high and low-income countries is emerging. Policy-makers in low-income countries are encouraged to do much more to boost performance. Comparison between the 2007 and 2010 Logistics Performance Index (LPI) indicates that for countries at same level of per capita income, those with the best logistics performance experience additional 1% growth in GDP and 2% in trade, World Bank, 2010). Global outlook is very positive, particularly for Asia pacific region. Dramatic growth of Asian Tigers (Singapore, Malaysia, Thailand, Indonesia), owes much of its success to effective logistics (Sum, Teo & Ng, 2001).

According to German Centre for research and Innovation (2013), Germany is a leading Logistics hub in the world with about 28 million people in the logistics field. The German Logistics industry accounted for about 228b Euros in 2012, making it the 3rd strongest industrial branch after automotive and trade fields. Germany was ranked 4th in the World Bank's 2012 LPI. In Australia, the performance of the ILS has a major impact on economy. According to Seventh annual state of Logistics Survey for South Africa (CSIR). (2010). the global competitiveness of South Africa is dependent on the effective performance of the logistics and supply chain sector. The logistics costs as a percentage of GDP in South Africa are too high as compared to those of Brazil. However, "When all aspects are considered, the logistics sector in South Africa is doing fairly well", Ittmann, & King (2010).

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According to WB-2013, Kenya's LPI has stagnated at about 2.1 from 2007 to 2010. Comparative figures with other world countries for the year 2012 are: Kenya - 2.59, America – 3.86, Germany – 4.11 China 3.49, South Africa 3.46, Brazil 3.2, India 3.12, and Cuba 2.07. Cost structures increase affects revenues of Government and firm's competitiveness in areas such as delivery times, product quality, and responsiveness of producers to consumer requirements continue to be eroded. Kenya needs to build its logistics strengths as a tourism, trade and distribution hub in the region, continent and world.

The Kenya Vision 2030 strategy is specifically tooled to focus on reforms and development in eight key sectors in the economic pillar. Among them is macroeconomic stability, infrastructure, energy, and STI (Science, Technology and Innovation). Critical problems being addressed include poor infrastructure and high energy costs. The electricity sub-sector is a major player in the energy sector. Mandated to make policy, produce, import, transmit, and distribute electric energy in Kenya. This sub-sector is dogged by apparent over-pricing, political interference, unhappy customers and high stock levels. Solutions must be sought from within by optimizing operations. High logistics costs arising from poor infrastructure and weak controls would result in prohibitive electricity energy costs. Empirically, effective Integrated Logistics is one area where most benefits may accrue with minimum input. It is vital then that ILS impact needs to be evaluated.

Over the years, some emerging characteristics appear to define the relationship between evaluation and impact trends. The greater the frequency of evaluation, the greater the chances for effectiveness and eventual impact. The more developed the economy, the higher the investments in IT/IS, therefore, the higher the Integration; that new technology is relatively better than old technology, yet less costly. The richer the economy, the newer the technology. For a firm or country to emerge successful, it must do two things: Know its position very well; continuously leverage its current resources in better ways than its

competitors, by unorthodox means. In Kenya, despite the fact that most forms of government evaluation such as Target setting, bench marking and evaluation meet stiff resistance from government employees, there is need to constantly evaluate impact of ILS to add value to managerial decisions.

Basoglu et al., (2007), in a research on organizational adoption of enterprise resource planning systems argues that there is lack of empirically supported research on ERP systems and user performance issues. This absence is the main motivation factor for him to evaluate the impact of ERP on user performance starting from the user point. That although past research has proved IT/IS impact on performance, the main aspects of the relationship between IT/IS and performance is the user. That the nature of future research must move towards user performance, user need, and expectations. It therefor follows that any evaluation of the effectiveness of ILS must seek such knowledge from users.

1.2 Statement of the Problem

The implementation of Integrated Logistics System (ILS) in the Electricity Sub-Sector (ESS) is faced with daunting challenges of globalization and high failure rate (Abugabah, and Sanzogni, 2009). In Kenya, like in many other jurisdictions, the Electricity Sub Sector has invested heavily in ILS. But, in spite of all this, the sector has recorded above-average tariffs and annual stock holding continues to escalate, thereby adversely impacting on stakeholders The effective ILS was intended to improve service delivery to inventory users, reduce material handling costs, and cycle time for implementing organizations, but its impact need to be evaluated. It was supposed to accelerate cost reductions in operations, time efficiency and to consolidate gains in term of business economic benefits. This far, the impact of ILS on cost reduction has neither been documented nor has the time efficiency strategy in operations called cycle time been given prominence as a vital area to gain business savings. This

research therefore sought to establish the impact of ILS in improving efficiency in service delivery, reducing costs and cycle time.

1.3   Research Objective

1.3.1   General objectives

The main objective of this study was to assess the impact of ILS on effective management of inventory in the electricity sub-sector in Kenya.

1.3.2   Specific objectives

i. To find out the extent to which quality ILS management practice affects warehouse customer service in the sub-sector

ii. To determine the extent to which ILS resource activation level influences cost reduction in the sub-sector.

iii. To explore the extent to which ILS capability levels influence cycle time reduction in the sub-sector

1.4   Research questions

i. To what extent has quality ILS management practice impacted on improving customer service in warehouses in the sub-sector?

ii. To what extent has ILS resource activation level affected the achievement of stock cost reduction in the sub-sector?

iii. To what extent has ILS capability level affected cycle time reduction in the sub-sector?

1.5   Justification of the Study

When the ESS's ability to sustain competitive advantage by using proper management tools such as ILS on their unique resources is guaranteed through valuable and relevant research, then I will be justified as an academician. Unlocking the potential of idle inventory by employing knowledge-based resources is vital. Such resources are difficult to imitate, are a

mainstay for gaining business economic benefits (BEB), competitive advantage and achieve superior corporate performance. There is need to develop capabilities through research in this area. The stakeholders such as government, shareholders, supply chain members and customers, stand to benefit from this research. More so, given that Electricity Sub-Sector (ESS) impacts heavily on the GDP and the achievement of vision 2030.

1.6   Scope of the Study

This study dwelt on ILS activities in the ESS in Kenya. The period from July 2008 to December 2012 was considered. The 42 warehouses under study are distributed in major cities and towns in the republic, as follows; (14) in Nairobi (1) in Mombasa, (1) in Kisumu, (3) In Nakuru, (2) in Eldoret and (1) in Nyeri. This cross sectional study was planned to take seven weeks but ended up taking twice the time. It was limited to issues relating to Logistics and the Integrated Concept in managing stock. The research analysed the purpose through the perspective of the sub-sector and solely looked into the internal functions within the ESS excluding the external environment.

1.7   Limitations of the Study

Some barriers encountered which impacted the completion of this study included scarcity of resources such as time and funds. Magnitude of population and the fact that target population was distributed across the country, the issue of distance and communication also emerged. Presence of targeted respondents and cooperation during delivery of questionnaire, questions being left unanswered, none- capture of issues such as clarifications, body language and lack of opportunity for respondents to open up also challenged the study.

1.8   Delimitations

While the researcher noted two respondents who feigned ignorance, it was possible to quickly get suitable replacements. For some of the targeted respondents who were too busy moving warehouse to a new location, it was possible to visit them later in their new office. This study

used a sample, The use of introductory letter, simple English, telephone and e-mail follow-up and reminders made it possible to build response to reasonable levels.

CHAPTER TWO

LITERATURE REVIEW

2.1   *Introduction*

The purpose of this chapter is to highlight the work of other scholars and researchers who have documented research work on the area of study Conceptual framework and empirical reviews are also included to guide the study.

2.2   *Logistics*

The aim of logistics is to provide a good customer service, low cost, low tied-up capital and small environmental consequences (Johnson, Johnson, & Mattson 2005; Shapiro, 1989) concurs. The credibility of logistics operation is based on how good the design of the system that leads to this kind of logistics is. "Logistics systems encompass operative responsibilities, which include administration, operation and purchase and constructive duties as well as detailed design" (Lumen, 1998). It is involved in all levels of planning and execution – strategic, operational, and tactical, current broader view of incorporating other players in the supply chain to achieve more synergistic benefits in logistic integration and practice of lean logistics as a new approach to reducing waste in the distribution centres. Walker and Wilson (2012) in their research case study on Nokia Supply Chain, contend that an aggressive integrated strategy alleviates business tragedies as happened with Nokia's Logistics team when their supplier for semi-conductors was suddenly incapacitated due to a fire.

Oana V., (2007) explored the impact of the respective process changes on organizational performance and argued that impact can be measured at three distinct levels – Automate, Informate and Transformate. Among the benefits cited accruing to organizations are customer service, cost reductions and cycle time reductions. O'Leary (2004) found that

the financial benefits are constant across industries and that the non-financial benefits vary from one industry to another.

Schubert and Williams (2011) agreed that research in this area is largely descriptive or prescriptive and outcomes focused. That the measurement of the fulfilment of objectives in projects is only possible on a qualitative and rather descriptive level since in most cases it is not possible to measure concrete success figures because the objectives have not been set accordingly. Out of 60 companies sampled, only 10% gave a ROI. Although they accept that ERP benefits may be classified into five dimensions - operational, managerial, strategic, IT infrastructure and organizational, they are working on a broader classification.

2.3   *Logistics Implementation levels*

Many establishments employ equivalent of billions of dollars and countless hours implementing ERP for better performance, yet the failure rate of ERP implementation is very high, (Abugabah, & Sanzogni, 2009). Their research focused on understanding the failure factors ignoring other important aspects. By use of the IS theory, proposing that users can best evaluate effectiveness of an ERP, the paper concludes that failure rate of ERP implementation is very high, due to lack of top management support and lack of training. The research attempts to evaluate actual impact of ERP system on its user performance by use of a well-established theoretical framework starting from the proposition that an information system can't by itself affect the productivity but the main efficiency factor lies in the way people use these technologies. (Botta – Genoulaz et al., 2007).

Daugherty et al., (1996) in their paper, "Integrated logistics: achieving logistics performance improvements", presents the results of a survey of logistics executives concerning their perceptions regarding integrated logistics. It focuses on an assessment of the current level of implementation of the integrated logistics concept among US firms and provides support for a relationship between integration and logistical performance

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improvements. The paper reveals that the results have significant managerial implications as more organizations place emphasis on supply chain management, and that internal and external integration are necessary to facilitate channel-wide linkages and enhance channel efficiency. Presumable as a consequence of this and other such positive researches, many developing countries invested in the ILS hoping to reap the same benefits. This has not been tested. Further, since their research, there is need to replicate the research not only to confirm the findings, but also to find if the understanding of integrated logistics is shared too.

Daugherty et al., (1996) argue that early discussions of integration were, for the most part, limited to integration within a firm. Staude (1987) concurred arguing about the need for interdepartmental and intradepartmental logistic integration. Kenderdine and Larson (1988) advocated for wider integrated logistics throughout the entire channel system for competitive advantage.

The ILS software package is used as an enterprise resource planning (ERP) tool across the four institutions in the ESS. However, although the tool has the same capacity, quality of management practices, activity levels and internal dynamics in respective firms may differ, therefore resulting performance levels in different firms may differ.

2.4   Quality of Management Practices

2.4.1   Quality of decision making and quality of internal operations

Quality management practices impact performance. Quality of decision Making and Quality of Internal operations are vital components for gaining competitive advantage and effective use of resources. Flynn B.B., et al., (2007) in their exploratory investigation of the relationship of specific quality management practices to quality performance argue for both core quality management practices and for the infrastructure that creates an environment supportive of their use. By use of multiple regression analysis they established that top management support and workforce management are core, that supplier relationships and

work attitudes were important infrastructure components for quality practices and quality performance measures. The results may be interpreted in the light of Gavins eight dimensions of quality: Performance, features, reliability, durability, serviceability, conformance, perceived quality and aesthetics. Garvin (1991). However, this research did not come across such endeavors having been recorded in Kenya.

2.4.2   Resource activation level

Measuring Impact of ILS across the integrated chain is vital. Remko & Hoek, (1998) proposed and developed a preliminary framework for measuring Unmeasurable performance across supply chains. This was necessary since traditional performance measures limited the possibilities to optimize supply chains, since its view was limited. The ILS, a supply chain concept fundamentally changes the nature of organizations, since control is no longer based on direct ownership and control, but rather based on integration across interfaces between functions and companies. These impacts measurement of performance. Traditional measurement approaches were abolished and a supply chain measurement system developed. While the perception of the level of automation indicates appreciation of the direction the sector takes in relation to automation, the level of third-party contracting will point at the utility of the potential of the ILS. The integration in the sector will impact level of electricity customer connectivity in the country, which the sector is created to serve.

2.5   Capability level

2.5.1User awareness of ILS system

User awareness about the ILS system is necessary, so as to enable the user to act. As postulated in the knowledge based theory, Karl, (2001) seeking to expand the field of knowledge management and intellectual capital beyond its operational and often inwardly technological focus to a new theory of the firm suggests a resource-based perspective, to guide strategy formulation. By transferring and converting knowledge externally and

internally to the organisation, people use their capacity-to-act in order to create value. Each time knowledge is transferred or conversion takes place, value grows. Managers must pursue a knowledge-based strategy to improve employee capacity-to-act both inside and outside the organisation.

2.5.2 *Knowledge of organization and capital structure*

According to Michalski G., (2008), If the benefits from holding inventory at a level determined by the firm is greater than the negative impact occasioned by holding the said inventory, then the value of the firm will grow over time. The ILS tool is intended to assist management to determine the levels of inventory at any given time otherwise referred to as on-line –real-time information systems. Further, the ILS maintains a dynamic integrated information on internal divisional integration by providing inventory, financial, management and manufacturing information at all strategic levels, be it corporate, managerial and operational. Horizontal, vertical integration is also facilitated, such that the user is able to create and maintain communication links with whole of the supply chain for economic benefits.

2.6 *Exploring and Measuring the Impact of ERPs*

Motivations for ERP implementation include both technical and business reasons such as:- Enable business growth: Replace disparate systems: Improve inefficient BPs: Reduce software maintenance burden by outsourcing: Reduce business operating and administrative expenses; Eliminate redundant data entry: Reduce inventory carrying costs: Reduce data errors: Acquire multicurrency IT support: Decrease computer operating costs: Eliminate delays and errors in filling customers' orders: Integrate applications cross-functionally and Standardize procedures across different locations.

2.7   Possible Analysis Paths for ERP

According to Shang and Seddon (2002), ERP benefits organisations at five dimensional levels: operational, managerial, strategic, IT infrastructural, and organizational. Dehning and Richardson, (2002) put forward a framework that captures five analysis paths of the relation between IT and firm performance. The first and most analysed link is the direct relation between IT and firm performance. The second, less analysed link provides insights into the relation between IT and business process (BP) measures such as gross margin, profit margin, turnover ratios, inventory turnover, customer service, quality, and efficiency. The third path analyses how these process measures combine to determine overall firm performance. The fourth and fifth show that contextual factors (e.g. industry, size, financial health, IT intensity) may affect the IT impact on both BPs and overall firm performance, Oana V, (2007).

At the project phase – success is measured in terms of project cost, completion time, and system functionality top management support, effective project management, business process reengineering (BPR), education and training, user involvement, and vendor support (Somers & Nelson, 2001; Nah and Lau, 2001; Al-Mashari et al., 2006). At the shakedown phase when the implementing company goes through the post-implementation adjustment period, these measurements are concerned with improvements in BP performance: the lead-time, service time, wait time and utilization, Oana, (2007). At the onward and upward phase when most of the benefits are expected and when the company plans further system and business development, success is measured in terms of economic benefits, improved business practices, and improved decision making.

A criteria to measure implementation success or performance must be established. Usually, in technology-based evaluations, success is measured through expectations and perceptions of those involved in the implementation. In addition to the internal subjective

measures, Oana, (2007). Markus et al., (2000) recommend the use of external criteria of success, such as operational and financial metrics, and the organization's goal for implementing the ERP system.

2.8   *Meeting Specific Customer Needs*

Dezdar and Ainin (2011) examining ERP implementation success from a project environment identified factors that are crucial for the successful implementation of ERP systems. They found a significant relationship between project management and team composition with successful ERP implementation. ERP adopting organizations and managers gain an understanding of the complexities inherent in ERP installations to avoid barriers and increase the likelihood of achieving desired results. The journal publishers comment that this study is one of the few that examine the success of ERP implementation. Although it has produced empirical evidence in support of theory of critical success factors and ERP implementation success, post-implementation evaluation was not mentioned.

Sumantri and Lau, (2011) stated that high logistics performance contributes to increased operational efficiency, improved accessibility to international network and increased trade volume. They identify information and communication technology and logistics service providers among key drivers of the economy in Indonesia. Indicators of effectiveness include improving operational level, improving customer service, accessing resources, reducing cost, focusing on core business, increasing market share, improving business performance, and developing business network.

Mahesh et al., (2008) gives an overview and concept of warehousing. Analysing the situation in warehouses by examining four of the biggest retail warehouses in Sweden, comparing the situation to the theoretical framework. They posit that merely installing the newer methods such as Integrated Logistics System does not mean that the system is effective and efficient; there is also necessity of a strong evaluation mechanism. By a mix of latest and

traditional strategies, technologies and methods, they achieved efficiency. They however, fail to mention how impact may be measured.

2.9   *Improved Customer Service*

Customers served in the warehouses include both internal and external customers. The object for business is to satisfy a need. The product/service itself has to sell; customers should be attracted to it right away. It has to be packaged the right way, product has to work. Customers using the product/service will talk about it to potential prospects. The right product also needs approval from the target market. A strategically located business requires heavy research and analysis before settling on the price place promotion and people. The target group should be questioned through surveys. The location has to be convenient and customers should be able to remember the spot. The price should be high enough to cover the costs but low as well to attract customers. Promotion needs to be done at the right time. Intensive campaigns to the right target group are necessary, finding as much about people as possible, giving them the best service deliverable and understanding legitimate concerns. In the ESS however, meeting specific customer needs becomes a problem, since the ESS is in a controlled market where government determines the price.

Quality improvement is the actions taken throughout the organization to increase the effectiveness of activities and processes to provide added benefits to both the organization and its customers. Basic ways of bringing about improvement in quality performance are by better control and raising standards. (ISO). The quality of electric power is in its constant presence, in the right voltage and safe.

Productivity is said to have improved when more output is achieved for the same input, or when the same output is achieved from less input. To improve productivity, factors including the process itself, the equipment and machinery used, the workforce or the indirect

processes affecting production must be addressed. Improvement should be viewed as a continuous cyclic process, a course of action based on information collected.

2.10 *Reduced Costs*

Reduced product costs result from optimizing all processes costs. Starting from procurement process, unit costs optimization by use of optimized procurement processes, optimizing manufacturing, storage distribution and administrative costs. Due to inflation, this remains a challenge. Scholars and management experts globally agree that in strategic logistics management, true integration has been achieved when both total cost analysis (TCA) and total quality control(TQC) merge both within each firm and between the set of firms comprising a distribution channel (Kenderdine & Larson 1988, Daugherty, Ellinger, & Gustin, 1996, Sumantri & Lau 2011, Mahesh et al., 2008). However, a fundamental question that deserves critical examination is whether the integration results in better service to the customer.

2.11 *Cycle Time Reductions*

Cycle time relates to the strategy of speed. As a major point to achieve competitive advantage, a business entity should endeavour to reduce activities cycle time to the minimum possible, by eliminating all redundancies. Cycle time reduction processes helps one examine each step in a core process and guides a team in redesigning each process to make it more effective, more efficient, more flexible, and less expensive while maintaining or improving quality.

Improving strategic focus involves constantly making unique business choices which stand the test of competition over time enabling the business entity to survive and thrive. Singapore has recorded phenomenal economic growth since independence. Sum, Teo and Ng, (2001) in one of the first major studies on Strategic Logistic Management recognize Integrated Logistics as a critical factor for competitive advantage, Bowersox & Cross (1996),

Bowersox & Daugherty, (1995) and Christopher, (1993) concur. Manjunatha et al., (2005) in a case study in India present a novel method of developing an integrated logistics model for organizations using the SCM system, succeeding to eliminate the drawbacks of existing ILS models.

The World Business Council for Sustainable Development (WBCSD, 2012) developed a framework that can underpin the license to operate, improve the quality of stakeholder engagement, help manage risks more effectively and identify ways to enhance the business contribution to society. They argue that all action without reflection leads to failure. They conclude that we must measure business impact to society by asking ourselves: Where did we start? Where are we now? Where are we heading? Where do we want to be and how will we know?

2.12 Conceptual Framework

For this study, independent variables are related to the management of ILS, while the dependent variable is business economic benefits (BEB) in terms of quality customer service, cost reduction and cycle time reduction. BEB is dependent on many variables but this study focuses on three being quality of management practices, resource activation level and capability level as presented in the conceptual framework (fig 1).

FIGURE 1

Conceptual Framework

INDEPENDENT VALIABLES   INTERVENING VARIABLES   DEPENDENT VALIABLES

Quality Management Practices
- Quality of decision Making
- **Performance targets**
- Quality of Internal operations

Resource Activation Level
- **Level of Automation**
- Level of customer Connectivity
- Level of Third-party contracting

Capability Level
- User Awareness of ILS
- Knowledge of organization and structure

Political

Economic

Social

Technological

Environmental

Legal

Demographic

Business Economic Benefits
- Customer service
- Cost reduction
- Cycle time reduction

Source: Author, (2013)

2.13   Interpretation of Variables

2.13.1 Quality of Management Practices

Quality of decision making is variable across different entities in the sub-sector. The quality
of decisions by management essentially determine the success or otherwise of the institution.
The higher the quality of decisions, the higher the economic benefits in terms of customer
service, reduced costs and cycle time reduction among others performance targets is a part of
quality decisions and can be used to measure quality management practice. Quality of
Internal operations is essentially how well the actual operations are curried out. The

efficiency and effectiveness forms the quality. A quality devoid of wastage, tending to perfection will impact positively on of customer service, costs and cycle time, thereby accruing vital business economic benefits.

Resource activation level

The ILS user ought to be conversant with the system, so as to be able to apply it appropriately. Basic education, skill training, and proper understanding of the ILS gives the user the necessary awareness of ILS system to create value. For any economic activity to be worthwhile, its Cost of working Capital must be lower than its net returns. Level of automation which is a part of activation level may be used to measure level of activation. This must not only be perceived to be, but must also be true. Internal dynamics will then be brought to bear on all classes of individual players, to appreciate and determine the cost of capital.

Capability Level

The capability level will impact utilization of the ILS, resulting in business economic benefits for the sector. While the Level of Automation impacts the internal operations of the individual warehouses in a company, Level of third-party contracting indicates how much the internal customers engage services of others who depend primarily on the services of the ESS warehouses to achieve their contractual obligations. Ultimately, the ESS is mandated to enhance electricity power customer Connectivity in the country.

Business Economic Benefits (BEB)

This study considered only three factors to represent BEB; customer service, cost reduction and cycle time reduction as the most important. Improved customer service affects output and positive attitude, thereby increasing turnover. Turnover increase in turn improves the overall performance of the firm. Cost reduction on the other hand affords lower prices and better margins, therefore improving profitability and competitiveness of the firm, a vital BEB.

While cycle time reduction saves on time for each and every operation and process. This reduces cost of working capital, thereby accruing BEB. All these are guided by the environment composed of the intervening variables. These are beyond the control of the ESS and include political, economic, social, technological, environmental and legal factors. They may emanate from the local, regional and global environment. Some of them are: Trading–blocks agreements; inter-country tariff and non-tariff trade barriers; statute; government policy; purchasing and procurement oversight authority (PPOA). No attempt was made to measure their effect on performance in this study.

2.14   Theoretical framework

2.14.1 Resource based theory

The resource-based view (RBV) of a firm was advanced by Penrose, (1959) and first named by Wernerfelt, (1984). in his article "A Resource-Based View of the Firm" It explains a firm's ability to deliver sustainable competitive advantage when resources are managed such that their outcomes cannot be imitated by competitors, which ultimately creates a competitive edge. That a firm's sustainable competitive advantage is reached by virtue of unique resources being rare, valuable, inimitable, non-tradable, and non-substitutable, as well as firm-specific. The key points of the theory as related to our research are: Identify the firm's potential key resources – ILS and potential of Idle inventory; These resources fulfill the *VRIN* criteria simultaneously:

Valuable – ILS and potential of Idle inventory will enable ESS to employ a value-creating strategy, by reducing its own weaknesses. *Rare* – in that only the sector holds and owns the resource, stock, the skilled manager and the skilled worker. *In-imitable* – the valuable resource is controlled by the ESS only. *Non-substitutable-* in that, stock reduction is a managerial capacity, trained skills are company specific. Care for and protect resources that possess these evaluations, because doing so can improve organizational performance

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That "resources" can be divided into resources and capabilities have been adopted throughout the resource-based view literature. In this respect, resources are tradable and non-specific to the firm, while capabilities are ordinarily firm-specific and are used to engage the resources within the firm, such as implicit processes to transfer knowledge within the firm. This distinction encompasses idle stock, management and worker skills as resource and capability respectively.

Caldeira & Ward, (2003) considered how resource based theory (RBT) can be used in the adoption and use of information systems and information technology (IS/IT). They conclude that key differentiators for long-term successful IS/IT deployment reside within the context of an organization, based on organizational competencies. They identified two factors that appeared to be the determinants of the different levels of success in IS/IT adoption and use. The two factors were also primarily associated with the internal context of the organization. Just like they did, this research will analyze its findings from the perspective of the RBT as extended by the KBT of the firm to understand the impact of ILS in the ESS.

Further, Kalling, (2003), describes the processes that firms and managers go through seeking to create and sustain competitive advantages using enterprise resource planning (ERP) systems, based on resource-based view (RBV). The resource management framework emerging therefrom describes cognitive and cultural factors that support or hinder progress, among them being uncertainty, knowledge gaps, knowledge transfer issues and the problems of ensuring that ERP usage is converted into competitive advantage. Further, the framework also addresses managerial implications.

As extended by the knowledge based theory of the firm (KBT), which considers knowledge as the most important resource of the firm. Knowledge-based resources are difficult to imitate and socially complex, varied knowledge bases and capabilities among the firms are major determinants of competitive advantage and superior corporate performance. This knowledge

is found in many forms such as organisational culture, identity, policy documents, systems and employees, Grant, (1991) & Makadok, (2001).

2.15 *Operationalization of Variables*

TABLE 1

Operationalization of Variables

Main Objective	Variable	Secondary Variable	Indicators
	Independent Variable		
Business Economic Benefits	Quality of Management Practices	Quality of Decision Making Quality of Internal operations	See indicators on Appendix viii
	Resource Activation Level	Third party Contractors Level of automation	
	Capability Level	User awareness of ILS	
	Dependent Variable Customer Service Cost Variation Cycle Time Variation Overall Performance	Customer Service Cost Variation Cycle Time Variation Overall Performance	

Source: **Author, (2013)**

2.16 *Study Gap*

The existing literature has revealed major gaps ranging from global to the Kenyan context in the topic under study. Globally, evaluation of impact of ILS has not been accorded enough attention, more so in developing countries. There is limited research on ILS in Africa. Evaluation before, during and after implementation of ILS is vital. In Kenya, there is need to document impact of ILS, more so given the huge investments in IT/IS, and logistics for integration in the electricity sub-sector.

METHODOLOGY *3.1 Introduction*

This chapter outlines the research methodology that is used to answer the questions raised in the study. The purpose of research design is to facilitate the research to be as efficient as possible, yielding maximal results. Further, to provide for the collection of relevant evidence with minimal expenditure of effort, time and money. It considers; the means of obtaining the information; availability and skills of the researcher; explanation of the way in which selected means of obtaining information is organized and the reasoning leading to the selection; the time available for the research and the cost factor relating to research, Mugenda & Mugenda, (1999), Kothari, (2004).

3.2 Research Design

The descriptive method was adopted, where the researcher sought to describe the state of affairs as per time of study. The researcher had no control over the research environment. Non- experimental design was adopted, cross sectional involving collection of data at a specific point in time. Topical scope was statistical, where inference from sample was made about the population. Research environment was the field while unit of analysis is individual warehouse location and unit of measure is the individual respondent.

3.3 Target Population

In this research, the population of interest was 13,800 employees of ESS. The target population consisted of those ESS staff in management who use the ILS. ILS users fall into two broad categories; primary and secondary users. Primary users are warehouses employees who implement and use ILS in their day-to-day operations. Secondary users are those in integrated divisions and are customers of the warehouses.

Integrated divisions for the study purpose included, supplies section who procure all materials all of which must pass through warehouses as stock items, IT-ILS support experts

who ensure that ILS user needs are met, finance management accounting staff who gather financial information by linking ILS with IFS, distribution chief officers who plan and design jobs interfacing with ILS and whose construction and maintenance teams use ILS to interface with DCS to draw materials from the warehouses, transport department senior officers whose vehicles transport materials (Goods in Transit) into and among warehouses using ILS interface with TMS.

3.4   Sample Design

A sample design is a definite plan determined before any data are actually collected, for obtaining a sample from a given population. Deliberate sampling/ purposive /non-probability sampling was used. Judgment sampling was used to arrive at employees who use ILS and are in management, Kothari, (2004).

3.4.1   Sampling procedure

From the sampling frame of 644 consisting of ESS employees who use ILS and are in management, a sample of 94 was envisaged as shown in the table below. The sample was made up of employees in the ESS, who use ILS, are in management, and they are within Nairobi. The reason being that employees in management are deemed to have a fairly high level of education, good command and understanding of systems and the company as well.

3.4.2   Sample size

The study used a sample of 94 respondents, made up of all employees in management who use ILS and are in Nairobi, Kothari, (2004).

TABLE 1

Sample Size

Players	Employees	Employees who use ILS	All employees in management who use ILS and are in Nairobi
KP	12,600	600	68
KenGen,	1,000	30	12
KETRACO	200	7	7
REC	190	7	7
Total	**13,990**	**644**	94

Source: **Author, (2013)**

3.5   Study Location

The study was conducted in Nairobi and its environs. Nairobi the capital city of Kenya is a business hub on the equator. Nairobi was chosen since this is where most of the warehouses as well as the bulk of value of stock is held. The head offices of respective players are also located in Nairobi, where managers and other key personnel may be found. Most activities, policy matters and decisions are made at the head office. It was also possible to save resources such as time and money, available to the researcher, since the research is self-sponsored.

3.6   Data Collection

This study collected primary data using a questionnaire as a tool. Considerations including: Nature of investigation, objective scope of inquiry, financial resources available, time, and desired degree of accuracy came into play.

3.6.1   Secondary data

Secondary data were obtained to supplement primary data. This was obtained from authentic sources such as existing official reports and documents from the named entities, journals, other researches in the area and any other relevant document from the libraries and internet. Academic standards in relation to references were observed.

3.6.2 Primary data

The primary data were sought due to its proximity to source of truth and its immense value in the study. Audited books of accounts, library books, periodicals and other relevant publications were used.

3.7 Construction of Research Instrument

The study formulated a questionnaire based on Gable, Sedera, and Chan, (2008) *IS-Impact Measurement Model.* Structured, semi-structured and unstructured questions were used to help the researcher get enough information. Five degrees Likert-type scale was used as much as possible to administer the independent variables, to ease data summary and allocating scores (Kothari, 2004). This study preferred questionnaires because they are familiar to most respondents, they are cost-effective to administer in terms of money and time and are easy to analyse. Further, using questionnaire as a tool, confidentiality is maintained, respondents have enough time to think through and give well thought-out answers relevant to the study. Questionnaires were administered using the "drop-pick-later" method as well as e-mail.

3.8 Validity and reliability

Pilot test, validity and reliability are discussed below. Pre-testing and piloting were done by piloting the questionnaire with a sample of 3 representatives of the target population quite separate from the sampled group. Pre-test and pilot study revealed deficiencies within the instruments which were rectified before they were administered to respondents. Pre-test run and piloting were done to increase reliability and effectiveness of the questionnaire.

Validity defines the strength of the final results and whether they can be taken as accurately describing the real world. It encompasses the entire experimental concept and establishes whether results obtained meet the requirements of the scientific research method. Internal validity is built by following all the steps of the scientific research method. This

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research measured reliability and appreciated external validity. Reliability is an essential component of validity. It describes the repeatability and consistency of a test. It was tested by use of Cronbach's Alpha analysis whenever a Likert – type scale was used, (see also appendix v). As a measure of internal consistency, a score of between 0.70 and 1 is normally acceptable, Tavakol & Dennick, (2011).

3.9   *Data Analysis*

This study attracted both primary and secondary data. For secondary data relating to trends, was used. Primary data were analysed and presented in form of frequency distribution tables, graphs, charts and percentages. Statistical Package for Social Sciences (SPSS) tool was used. This tool was chosen because of its capacity to generate statistical information, increased accuracy and saving on time, compared to manual data analysis.

Statistics used included mean, mode for indicating opinion of most respondents; standard deviation to indicate dispersion. For test of relationships between variables, correlation and regression were used.

Regression analysis:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e} \tag{1}$$

Whereby $\mathbf{Y}$ = Effective Performance (dependent valuable)

$\mathbf{X_1, X_2, X_3}$ are predictor variables

$\mathbf{\beta_0, \beta_1, \beta_2}$, and $\mathbf{\beta_3}$ are constants.

$\mathbf{e}$ is the error factor

Predictor variables $\mathbf{X_1}$= Quality of management practice

$\mathbf{X_2}$ = Resource activation level

$\mathbf{X_3}$ = Capability level

High ethical standards were maintained. Permissions to do this research and to collect data was sought and obtained from the university and the energy sector.

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CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESEARCH FINDINGS

4.1   Introduction

This chapter presents the results of the field research and covers the research findings, data analysis and discussion of the findings. Descriptive statistics was used in analyzing the data. The main purpose of this study was to assess the impact of quality ILS management practice, ILS resource activation level and ILS capability level in terms of business economic benefits (BEB) on managing inventory in the electricity sub-sector in Kenya, by seeking and establishing opinion of the owners, users and customers of the ILS, particularly in improving efficiency in service delivery, reducing costs and cycle time.

This research attempts to evaluate actual impact of ILS system on its user effective performance and perception, agreeing with (Botta – Genoulaz et al., 2005) that an information system can't by itself affect the productivity but the main efficiency factor lies in the way people use these technologies. The subject knowledge was captured through structured questionnaires to the staff members as users and warehouse customers in relation to the impact of ILS in improving customer service, in achieving overall stock cost reduction as well as the extent to which this resource ILS has impacted cycle time reduction in the sector. Two managers interviewed confirmed module implementation levels to be the same across board. Also, the research examined audited financial statements. This research measured technology-based impact through expectations and perceptions of those involved in the implementation and use as well as by internal subjective measures, as advocated by Oana, (2007). Further, external criteria of success, such as financial metrics were used, as advocated by. Markus et al., (2000) The resource based view, Penrose, (1959), Wernerfelt, (1984). and knowledge based theory Grant, (1991) & Makadok, (2001). also informed the analysis.

The ESS players encourage sharing warehouse services, pursuant to what Kenderdine & Larson 1988 called true integration. Here, (TCA) and (TQC) merge in both internal and vertical integration within and among players comprising a distribution channel. Therefore, one will find that warehouses in KP serve REC and KETRACO, which concurs with suggestions made by Mahesh et al., 2008 and supported by Sumantri & Lau 2011,). This aims at enhancing customer service, reducing costs and cycle time.

4.2   Response rate

The total number of respondents targeted for the study was 94. Majority of the targeted (74.5%) responded to the questionnaires. While two responses were rejected since the respondents indicated they either did not know what to fill in or they reserved their opinion, another three were returned partially filled and the targeted respondents indicated that they were short of time. Therefore, among the targeted sample of 94, 70 (74.5%) proceed to data analysis. (see table 3 below). The results obtained are discussed below.

TABLE 2

Summary of the Key Respondents

Organization	Sample	Respondents	Per cent (%)
REC	7	6	85.7
KETRACO	7	5	71.4
KenGen	12	8	66.7
KPLC	68	51	75.0
Total	**94**	**70**	**74.5**

Source: Author, (2013)

4.2.1   Respondents Bio data

This section dealt with the background information and personal profiles of the respondents. The areas discussed include gender, age and level of education.

Gender of the respondents

The study sought to find out the gender of staff members of the ESS as a research practice. Among the staff members, 65.7 % were male as compared to the female (32.9 %) as shown from table 4 below.

TABLE 3

Gender of the Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
	Female	23	32.9	33.3	33.3
Valid	Male	46	65.7	66.7	100.0
	Total	69	98.6	100.0	
Missing	-999	1	1.4		
Total		70	100.0		

Source: **Author, (2013)**

From the findings, it is evident that majority of the workers in the ESS are male. This could be attributed to the nature of work carried out in the organization which tends to favour the male as compared to the female.

Age of the respondents

The researcher sought to know the age of respondents categorized in age brackets. The response is given in table 5 below.

TABLE 4

Age of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
	18 – 30	5	7.1	7.1	7.1
	31 – 40	29	41.4	41.4	48.6
Valid	41 – 50	29	41.4	41.4	90.0
	51 – 60	7	10.0	10.0	100.0
	Total	70	100.0	100.0	

Source: **Author, (2013)**

As for the age brackets of the respondents,18 to 30 years were 7.1 %, 31 to 40 years made 41.4% of the respondents, 41-50 years (41.4 %). and 51-60 years were 10%. as illustrated in table 5 above. The larger group therefore, (82.8 %) falls between 31 and 50 years. The idea of giving age bracket was part of generating general biodata in the warehouse for the designated respondents and determines the relationship between different age groups and their knowledge on the impact of the Integrated Logistics System (ILS) for managing inventory.

Level of education of respondents

Basic education gives exposure, ups reasoning and level of skills to communicate. Generally, the higher the level of education, the broader the view and the more exposed. The study sought to establish the level of education of staff members.

TABLE 5

Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
	Primary School	3	4.3	4.3	4.3
	Secondary	6	8.6	8.6	12.9
Valid	Polytechnic/ College	13	18.6	18.6	31.4
	University	48	68.6	68.6	100.0
	Total	70	100.0	100.0	

Source: Author, (2013)

Out of the 70 who participated in this study, only 3(4.3 %) had primary level education, 6(8.6%) had secondary level education, thirteen (18.6%) had college level of education while the remaining 48 (68.6%) had at least a degree. This implies that most workers in the organisation are educated to university level as shown in the table below. Generally, well-educated employees are knowledgeable and their opinion, action and decisions are well- thought out.

Type of user

The researcher expected to deal with two classes of respondents, those who routinely use the ILS and those who by nature are customers of the warehouses and therefore, use the ILS but not on a daily basis. Warehouse operatives and in-charges form the users.

TABLE 6

Type of User

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Customer	32	45.7	45.7	45.7
	warehouse-in-charge	38	54.3	54.3	100.0
	Total	70	100.0	100.0	

Source: Author, (2013)

On the nature of interaction with ILS, the results reveal that a great majority (54.3%) are either warehouse manager or operatives, who by nature have to interact with the ILS system continuously in a day. The remaining, 45.7% were customers. These findings indicate that there was a good spread of respondents between users and customers of the ILS in the ESS. Representation of both users and customers was a vital aspect to assist the researcher get opinions from both the two groups. Largely, the results of this study capture the integrated nature of interaction with ILS to manage inventory.

Frequency of Use of ILS

To be in a position to comment about the ILS effectively, it would be imperative to opinionate from a point of knowledge about the subject matter. One of the ways the researcher used was the level and degree of exposure to the ILS system. The researcher targeted respondents who interacted with and use ILS**.**

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TABLE 7

Frequency of Use of ILS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Other	1	1.4	1.4	1.4
	Never	3	4.3	4.3	5.7
	rarely	10	14.3	14.3	20.0
	Weekly	6	8.6	8.6	28.6
	Daily	50	71.4	71.4	100.0
	Total	70	100.0	100.0	

Source: Author, (2013)

When the respondents were asked how often they use ILS, out of the 70 respondents, majority of them (71.4%) indicated that they used it daily, 15.7 % rarely used it (this includes the class of others" who had specified that they used it monthly). Eight point six percent used it weekly while (4.3%) never use it at all. This agrees both with nature of interaction (see above) and what the research found on the ground. While users interact daily with the system, customers would require routine weekly or monthly interaction to derive reports from the ILS. Such customers include those from finance, customer-service and also distribution and third-party-customers, as well as from transport.

Wage Bracket:

The wage group was intended to further confirm that respondents are actually at management level, where the wage brackets start from about 40 thousand. But since the researcher felt that this should not be too conspicuous to the respondent, different brackets were used. Still the same conclusion can be derived.

TABLE 8

Wage Bracket of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50 and below	10	14.3	14.7	14.7
	51 – 100	20	28.6	29.4	44.1
	101 - 150	14	20.0	20.6	64.7
	151 - 200	15	21.4	22.1	86.8
	201+	9	12.9	13.2	100.0
	Total	68	97.1	100.0	
Missing	System	2	2.9		
Total		70	100.0		

Source: Author, (2013)

Out of the respondents, 13.2 % were earning above 200 thousand shillings and 21.4% were earning 151 to 200 thousands shillings. Further, (20.0%) were earning between 101 - 150, thousand shillings while a significant 14.3 % were getting the wage of between 51- 100, 000. Finally, only 14.3 % earn 50,000 and below. Therefore, 85.3 % of the respondents earn above 50 thousand shillings. Thus we may say that most of the respondents are well-paid officers of the company. Further, this affirms the assumption made by the researcher initially that level of pay is generally a good indicator of seniority, (see table 9).

Work Experience

It is imperative that opinion be sought from the most informed. The researcher anticipated that to have risen to management level, the respondent must have had wide experience, knowledge and exposure in the ESS and the field of SCM, and therefore, best placed to give an opinion on behalf of the warehouse he/she heads.

TABLE 9

Years Working in Organization

		Frequency	Percent	Valid Percent	Cumulative Percent
	5 and below	16	22.9	22.9	22.9
	6 - 10	17	24.3	24.3	47.1
Valid	11 - 15	10	14.3	14.3	61.4
	above 15	27	38.6	38.6	100.0
	Total	70	100.0	100.0	

Source: Author, (2013)

When the respondents were categorized by the number of years in service, (38.6 %) of them indicated they had worked for a period of more than 15 years in the ESS, while 24.3 % had been in the ESS for a period of 6-10 years. Those who had been in service for a period of 5 years and below were (22.9 %) and a minority 14.3 % had been in the organization for a period of 11-15 years. This implies that 77.1% of the respondents have been in the ESS for the whole period under study since 2008. Therefore the evidence supports the researcher's view and further gives credence to the opinions they give about the issue under study.

The study revealed that most of workers in the warehouses are well-placed in terms of long term professional service. It also shows that those who had worked for the very minimum number of years among the respondents were a small proportion. These data provide a clear indication that majority of the workers interviewed had served for a long time and expectedly gained the necessary experience. Based on this, it was expected that they would have a significant level of knowledge on the subject matter.

4.3   *Integrated Logistics System (ILS)*

Current Stock in the Warehouse

Availability of adequate inventory is an integral component of customer satisfaction.

TABLE 10

Current Value of Stock in the Warehouse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 500,000	8	11.4	11.4	11.4
	.5 million to 1 billion	18	25.7	25.7	37.1
	Above 1 Billion to 3 Billion	13	18.6	18.6	55.7
	Above 3 Billion to 5 Billion	7	10.0	10.0	65.7
	Above 5 Billion	24	34.3	34.3	100.0
	Total	70	100.0	100.0	

Source: Author, (2013)

Majority of the respondents, (34.3 %) indicated that the current stocks in the warehouse were above 5 billion. Other 25.7% indicated that their current stock values in the warehouse range between 0.5 and 1 billion shillings. A significant 18.6 % indicated that their current stock was ranging between 1 billion and 3 billion, 11.4% indicated their stock was below 500,000. While only 7(10%) of the respondents indicated that their warehouses had inventory value of 3 to 5 billion shillings. These findings indicate that most of the respondents (62.9 %) were drown from large warehouses with stock values of above one billion shillings in the ESS, which are located in Nairobi. This gives credence to initial assumption that to target warehouses in Nairobi would capture a large representation of the total value of stock in the ESS. However, while some warehouses are big, others are small.

Number of Stock Items

The researcher sought to know the number of stock items in the store of the respondent. This would give an idea of the utility and usefulness of the ILS system. The more the items, the more justification for an ERP system. The findings are in a table below.

TABLE 11

Number of Stock Items in Warehouse

		Frequency	Percent	Valid Percent	Cumulative Percent
	Below 500	12	17.1	17.1	17.1
	501 to 2,000	17	24.3	24.3	41.4
Valid	2,001 to 4, 000	11	15.7	15.7	57.1
	4,001 to 6,000	13	18.6	18.6	75.7
	Above 6,000	17	24.3	24.3	100.0
	Total	70	100.0	100.0	

Source: Author, (2013)

This research found that the number of stock items varied across the different warehouses. An insignificant 17.1 % of the warehouses had below 500 stock items 24.3 % of the warehouses had between 501 and 2, 000 and Above 6,000 each, 15.7% had 2001 to 4000 stock items. A small percentage, (18.6%) of the warehouses indicated having 4,000 to 6,000 different stock items. This is a clear indication that the number of stocks items managed by the ILS is over 6,000, though at some stores some stock codes may be dormant. It would not be easy to manage over 6,000 stock items without an ERP system. Furthermore, the number of stock codes was relative to the size of the warehouse, (see table 11 & 12above)

4.4   Predictor Variables

4.4.1   Quality Management Practices

Quality of management practices in this research is divided into two specific factors, being quality of decision making and quality of internal operations. Each of the two is now considered below.

Quality of Decision Making

To evaluate the quality of decision making as a component of quality management practices, this research posed eight questions to the respondents. Their responses are summarised and discussed below.

TABLE 12

Quality of Decision Making

Indicator	SA		A		RO		D		SD	
	F	%	F	%	F	%	F	%	F	%
Facilitated achievement of strategic milestones	19	27.1	32	45.7	15	21.4	4	5.7	0	0
Customer feedback mechanism	21	30	40	57.1	6	8.6	3	4.3	0	0
Business process reengineering	19	27.1	30	42.9	15	21.4	6	8.6	0	0
ILS upgrading	17	24.3	43	61.4	7	10	3	4.3	0	0
ILS training	11	15.7	31	44.3	17	24.3	11	15.7	0	0
Team talk	16	22.9	29	41.4	14	20	7	10	4	5.7
Has improved business practices	25	35.7	38	54.3	5	7.1	2	2.9	0	0
Has improved decision making	22	31.4	29	41.4	12	17.1	7	10	0	0
Total	150	214	272	389	91	130	43	61.5	4	5.7
Average	19	26.8	34	48.6	11	16.2	5	7.69	0.5	0.7

Source: Author, (2013)

FIGURE 2

Quality of Decision Making
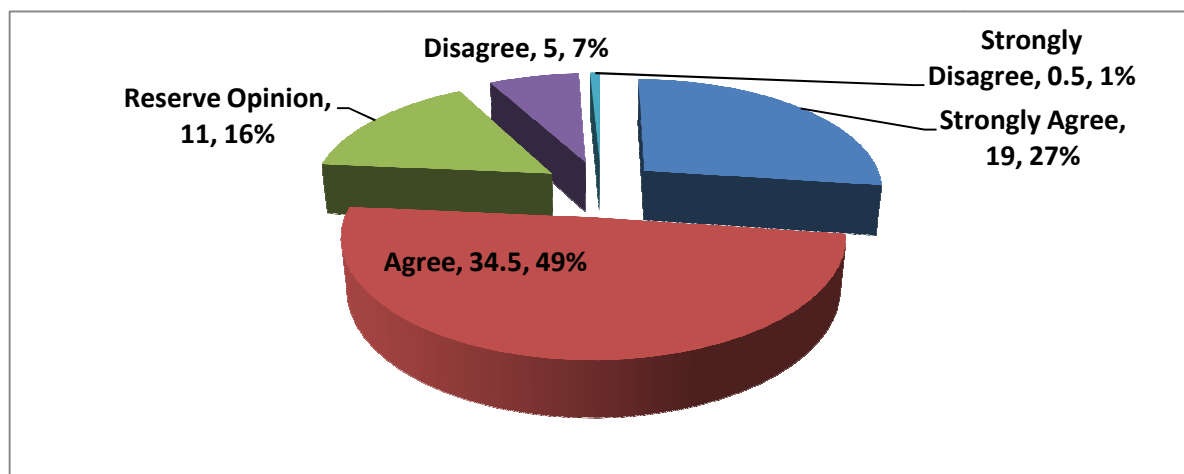
Source: Author, (2013)

27 % of the respondents indicated that they strongly agree that quality of decision making had improved over time, 49 % agreed. 16% of the respondents reserved their opinion. However, 7 % disagreed as 1% strongly disagreed that quality of decision making had improved over time. It is apparent that majority (76%) hold the view that there is quality management practice in terms of improved decision making.

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Quality of internal operations

The researcher to evaluate the quality management practices posed ten questions on a Yes/No scale. The responses are shown in a table and a pie chart below, followed by a discussion of some of the indicators.

TABLE 13

Quality of Internal Operations

Indicator	YES		NO		
	F	%	F	%	
Performance targets with subordinates	50	71.4	20	28.6	
Performance targets with Manager	59	84.3	11	15.7	
Customer feedback mechanism	62	88.6	8	11.4	
Meet user demand	50	71.4	19	27.1	
Meet emergency needs	59	84.3	11	15.7	
Monitor customer turn-over	44	62.9	26	37.1	
Stand-by staff at night	48	68.6	22	31.4	
Observing PPOA requirements	58	82.9	12	17.1	
Manager Sits in the BOD	24	34.3	45	64.3	

Source: Author, (2013)

FIGURE 3

Quality of Internal Operations

Source: Author, (2013)

40
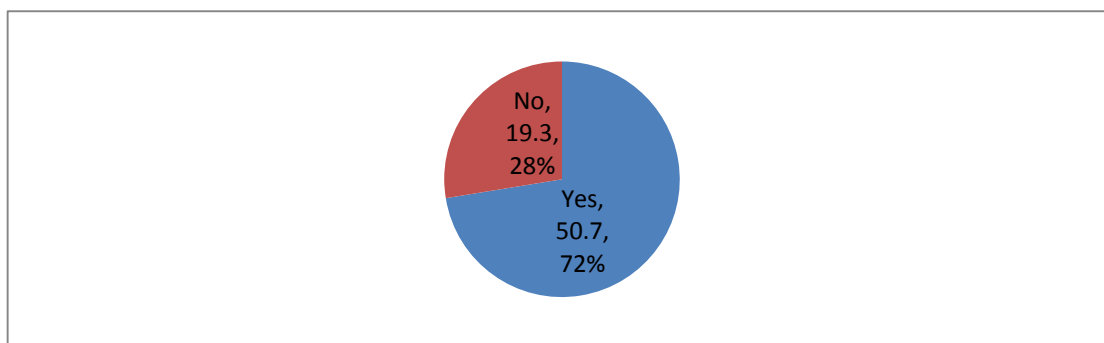
While on average 72% of the respondents agreed that there was quality management practices, a minority of 28 % disagreed. Detailed responses are enumerated and discussed here below.

Presence of a feed back mechanism - By establishing channels to encourage and funnel feedback from customers, the ILS organisation creates a critical structure that supports customer engagement. The study found that majority of the warehouse acknowledged that there was customer feedback mechanism (88.6%) while some 11.4 % indicated that the feedback mechanisms was lacking. It is, therefore, fair to conclude that the needs of the customer to give feedback are sufficient in most of the warehouses in the ESS.

Meeting User Demand - Meeting user demand as it arises is the key role of a warehouse in an organization. To maximize its full potential, it is vital that the ESS have effective warehouses, more so because the sector serves a critical resource – electricity energy. According to the respondents, majority (71.4 %) were of the opinion that the warehouses meet their customers' needs as they arise while 27.1 % felt that the warehouses do not meet customer needs as they arise. From the foregoing, there is a strong indication that the ILS has impacted favourably on customer service in most of the warehouses in the ESS.

Mechanisms for meeting emergencies - Asked whether they had mechanisms for meeting emergencies, majority of the respondents (84.3%) said that they had, while only 15.7 % said they did not have.

System to monitor customer turn over - Measuring customer turnover is critical to business success. Many companies use systems to measure how many customers they get in a specific timeframe and how many customers after that timeframe they are left with. In regard to this research, more than half of the respondents (62.9 %) said the systems to monitor customer turnover were in place, 37.1% said the systems were missing. This is an area the system needs to work on, so as to improve on quality of customer service and performance.

Standby service at night - With the nature of the service the organization is engaging in, it is essential to have some staff working at night so as to serve customers at all times. A round the clock, service (24/7) is becoming more and more relevant, as the push to have a 24-hour economy gains momentum in the country. When asked whether they had stand-by staff at night, 68.6% indicated there was, while 31.4 % indicated there was none. Given that only some of the ESS players require stand-by staff in their warehouses, the fact that this service is available indicates very good customer service. The ILS system affords a 24 hour service to all customers, all year round.

4.4.2 Resource activation levels

TABLE 14

Resource Activation Levels

Indicator	SA		A		RO		D		SD	
	F	%	F	%	F	%	F	%	F	%
Third party contractors	32	45.7	19	27.1	15	21.4	3	4.3	1	1.4
On-line-real-time –processing	20	28	29	41.4	10	14.3	11	15.7	0	0
Automated processes	24	34.3	34	48.6	3	4.3	8	11.4	1	1.4
Total	76	108	82	117	28	40	22	31.4	2	2.8
Average	25	36	27	39	9.3	13.3	7	10.5	0.7	0.9

Source Author (2013)

FIGURE 4

Resource Activation Levels

Source Author (2013)

42
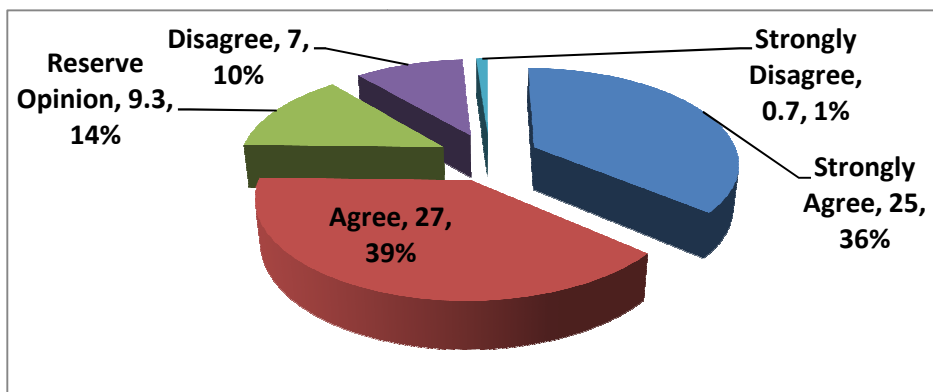
Thirty six percent (36 %) of the respondents indicated that they strongly agree that resource activation levels had increased while 39 % agreed. 14% of the respondents reserved their opinion. However, 10 % disagreed as 1% strongly disagreed that resource activation level had increased. Detailed responses are now discussed here below.

Third party contractors - Third party contractors are customers in the warehouses. When customers increase, more resources are demanded to cater for them. If the same resources are able to manage the increase, it means their initial capacity was high. The researcher contended that ILS has capacity to handle increase of customers many folds, owing to better utility of resources. Majority (72.8%) of the respondents agreed that third party contractors have increased many folds over the last five years in their warehouses while a small proportion of respondents (5.7%) disagreed and a minority (21.4%) reserved their opinions. This last group probably being the internal customers, who may not be aware of the extent of increase of external customers.

Still, majority (71.0%) of the respondents agreed that their warehouses achieved on-line real-time processing over the last five years while a significant proportion of respondents (15.7%) disagreed and a significant minority (14.3%) reserved their opinions. These findings agree with the theoretical framework that stock-outs would reduce over the period under study, and availability of on-line-real-time data processing. During interview, one manager confirmed that a fundamental practice before opening a warehouse is ensuring its capacity to be on-line so as to afford real-time data processing, just like is the case with shops selling electricity tokens for prepaid meters to prepaid customers.

4.4.3 Capability Levels

To establish the level of knowledge and understanding of the "integrated concept", the researcher posed two questions requiring respondents to indicate the level to which they associated the integrated concept to "information systems" and to "organizational structure".

To the extent the respondents would associate "integrated concept" to both "information systems" and to "organizational structure", there then the level of their understanding and appreciation of the "integrated concept" will be placed.

TABLE 15

Capabilities Levels

	VHA		HA		NO		LA		VLA	
	F	%	F	%	F	%	F	%	F	%
Association of ILS to IS	28	40	36	51.4	2	2.9	4	5.7	0	0
Association of ILS to organizational structure	20	28.6	38	54.3	7	10	4	5.7	1	1.4
Total	48	68.6	74	106	9	13	8	11	1	1.4
Average	24	34.3	37	52.9	4.5	6.5	4	5.7	0.5	0.7

Source: Author (2013)

FIGURE 5

Capabilities Levels
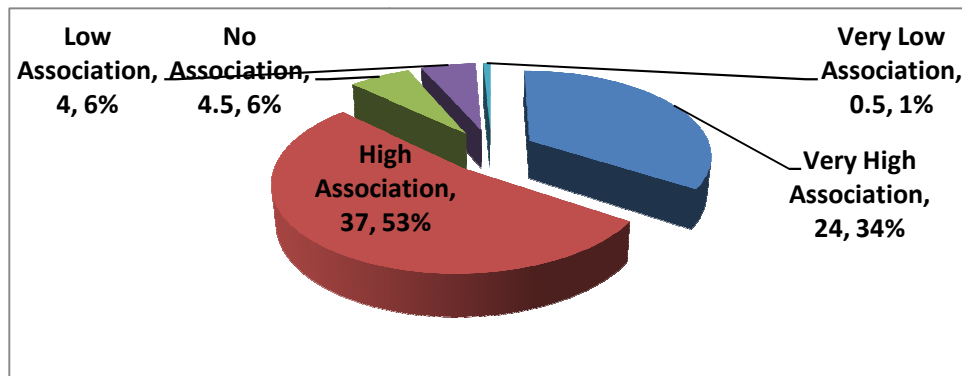
Source: Author (2013)

34% of the respondents said that they had a very high association of ILS with Information systems as well as had a very high association of ILS with organizational structure. 53% of the respondents said that they had a high association of ILS with Information systems as well as had high association of ILS with organizational structure. Only 6% of the respondents said that they did not associate ILS with Information systems as well as did not associate ILS with organizational structure. 6% of the respondents said that they had a low association of ILS with Information systems as well as had low association of ILS with organizational structure.

6% of the respondents said that they had a low association of ILS with Information systems as well as had low association of ILS with organizational structure. 1% of the respondents said that they had a very low association of ILS with Information systems as well as had very low association of ILS with organizational structure.

Out of the 70 respondents, a great majority (91.4 %) indicated high association, 5.7 % indicated low association and only 2.9 % reserved their opinions. On associating the integrated concept with organizational structure, majority (82.9%) indicated that they had high association, 7.1 % indicated low association and 10 % of the respondents reserved their opinions. These responses clearly indicate a very high understanding of the integrated concept among the respondents, thereby enhancing credibility and substance of their opinions in this research. See table 17 above.

4.5   Dependent variables.

This section captures the dependent variables for the study. These are customer service levels, cost reduction and cycle time reduction.

4.5.1 Customer Service Levels.

The table below summarizes respondents' opinions regarding particular questions posed relating to customer service. Response was on a 5 degree summated scale ranging from Strongly Agree (SA) to Strongly Disagree (SD).

TABLE 16

Customer Service

Indicator	SA		A		RO		D		SD	
	F	%	F	%	F	%	F	%	F	%
Customer complaints	18	25.7	36	51.4	7	10	8	11.4	1	1.4
Customer positive feed-back	17	24.3	33	47.1	11	15.7	9	12.9	0	0
Customer responsiveness score	15	21.4	43	61.4	9	12.9	3	4.3	0	0
Top management concern for customer	27	38.6	27	38.6	10	14.3	5	7.1	1	1.4
Improved customer service	22	31.4	43	61.4	2	2.9	3	4.3	0	0
TOTAL	99	141	182	260	39	55.8	28	40	2	2.8
Mean	20	28.3	36.4	52	7.8	11.2	5.6	8	0.4	0.6

Source: Author, (2013)

FIGURE 6

Customer Service
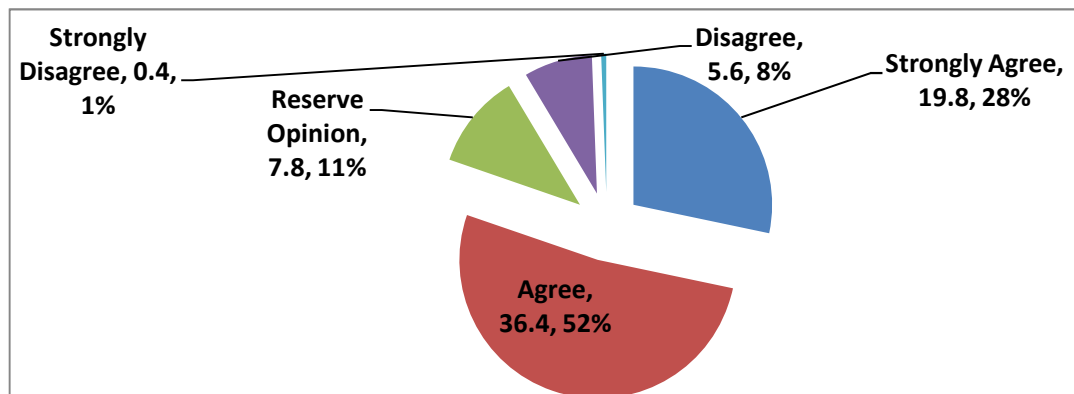
Source: Author, (2013)

On average, 28% strongly agree that there was quality customer service while 52% agreed. 11% of the respondents reserved their opinion, however, a small 8% disagreed and only 1% strongly disagreed. Therefore a majority of 80% at least agree that there was quality customer service in the seb-sector. The indicators are discussed herebelow.

Customer Feedback - While an improved customer feedback mechanism avails customers a good channel to give feedback, its use results in reduced customer complaints and increasing

customer positive feedback. When top management shows real concern for customer's wellbeing, the customer is delighted and will support the product or service on offer. In this way, the ESS would achieve business process reengineering (BPR), for better and faster growth. Another way of ensuring good customer service is by remaining technologically up-to-date. This may be achieved in our case by regularly upgrading ILS, the ERP system in use by the sector. Further, constant ILS training and weekly team-talk on service delivery would go a long way to ensure top-class customer service.

4.5.2   Cost Reduction

The study sought to establish opinion on impact of ILS on overall stock cost reduction in the ESS. Cost reductions may be achieved directly by reduction of actual stock quantity and price or by reduction of the indirect costs relating thereto. In most cases than not, an increase in direct costs is accompanied by a simultaneous increase in the indirect costs and vice versa. Table below is a summary of responses in relation to cost reduction.

TABLE 17

Cost Reduction

Indicator	LI		SI		S		SD		LD	
	F	%	F	%	F	%	F	%	F	%
Total stock holding	44	62.9	9	12.9	11	15.7	4	5.7	2	2.9
Overall Divisional Performance	23	32.9	20	28.9	20	28.9	6	8.6	1	1.4
Cost of working capital	22	31.4	19	27.1	18	25.7	7	10	4	5.7
Moving average price	11	15.7	24	34.3	29	41.4	5	7.1	1	1.4
Efficiency	20	28.6	30	42.9	14	20	1	1.4	5	7.1
Inventory turnover	16	22.9	24	34.3	21	30	7	10	2	2.9
Obsolescence	11	15.7	15	21.4	17	24.3	18	25.7	9	12.9
Required storage space	25	35.7	24	34.3	8	11.4	5	7.1	8	11.4
Quotation price for service lines	16	22.9	20	28.6	24	34.3	4	5.7	6	8.6
Power tariffs	11	15.7	27	38.6	28	40	2	2.9	2	2.9
Reduced costs	19	27.1	30	42.9	5	7.1	15	21.4	1	1.4
Total	218	312	242	346	195	279	74	106	41	58.6
Average	19.8	28.3	22	31.5	18	25.3	6.727	9.6	3.73	5.33

Source: Author, (2013)

FIGURE 7

Cost Reduction
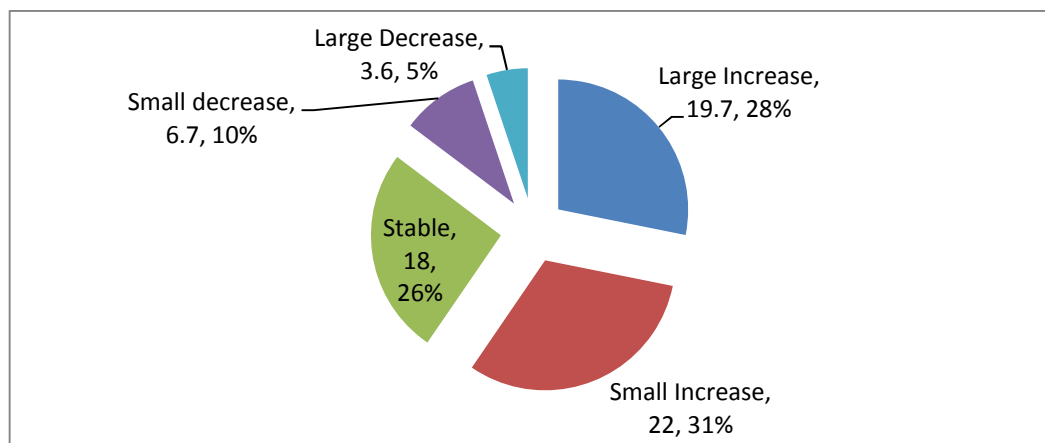
Source: Author (2013)

On average, 28% of the respondents agree that there was a large Incecrease in costs while 31% agree that there was a small increase in costs. 26% of the respondents said that the costs remained stable. While only 10% of the respondents said that there was a small

decrease in costs, 5% maintain that there was a large decrease in costs. Indivial indicators are now discussed herebelow.

Trend of total stock holding - Stock holding implies dormant funds, representing an opportunity cost. Stock also attracts other indirect costs such as insurance, security, space rent, and personnel costs. The higher the stock, the higher the holding costs. Majority (75.8%) of the respondents felt that there was increase of stock holding in their stores, fifteen point seven percent felt that stock holding had remained stable over the last five years and only a negligible portion of respondents (8.6%), were of the opinion that stock holding had decreased in their warehouses over the period. The ILS is supposed to assist management to keep stock levels at the EOQ, other things remaining constant. The potential of the ILS goes to waste as stock holding escalates even beyond EOQ.

Overall divisional and sector performance - Divisional performance is measured against divisional targets. Divisional objectives revolve around the supply chain including logistics. Logically, when supply chain objectives are achieved, by extension, logistics objectives will have been met too, and so will the results impact the company and the ESS. Majority (61.8%) of the respondents felt that there was increase in overall divisional performance in their warehouses, a minority (28.9%) felt that overall divisional performance had remained stable over the last five years and a significant (10%), were of the opinion that overall divisional performance had decrease in their warehouses over the period. A major objective of the division is to maintain budgetary regulations, mainly by cutting costs. Warehouses operate under strict budgets which are under the control of the warehouse manager, most of which responded to the researcher's questionnaire.

Cost of working capital - Cost of working capital here refers to the monies tied up in stock, assuming that the money was borrowed at local going rates. Consequently, the higher the stock, the higher the cost of capital. Majority (58.5%) of the respondents felt that there was

increase of cost of working capital in their stores, a minority 25.0.% felt that cost of working capital had remained stable over the last five years and a significant (15.7 %), were of the opinion that cost of working capital had decreased in their stores over the period. Warehouse appears not to have achieved much to use the potential of the ILS to manage costs.

Moving average price (MAP) - On the other hand, the ILS has capacity to monitor and give moving average price report so as to facilitate price management, in a free market environment. The opinion regarding the trend of the MAP the sub-sector's stock valuation model, (50%) of the respondents felt that there was increase of MAP in their stores, while (41.4%) felt that MAP had remained stable over the last five years and only a small portion of respondents (8.5%) were of the opinion that MAP had decreased in their stores over the period. Strict adherence to the ILS MAP is important to ensure that all costs are fairly distributed to different jobs, so as to maintain a fair price for the electricity connectivity as well as the tariffs.

Efficiency - Findings on efficiency portray a very promising performance, commensurate with the theoretical framework. majority (71.5%) of the respondents felt that there was increase of efficiency in their stores, a minority (20%) felt that efficiency had remained stable over the last five years and only a small portion of respondents (8.5%)were of the opinion that efficiency had decreased in their stores over the period. These findings concur with those of efficiency ratios analysis and Sumantri and Lau (2011), who contend that high logistics performance contributes to increased trade volume, arguing that logistics service providers are among key drivers of developed economies.

As for Stock Turnover**,** (57.2%) of the respondents agreed there was increased stock turn-over over the last five years in their warehouses, a significant (30%) reserved their opinions while only (12.9%) disagreed with the fact that there was increased stock turn over. These findings were in agreement with those obtained by ratio analysis. The above results

were further reinforced when the same question was rephrased *(inventory turnover)* in the same questionnaire where results were almost replicated.

FIGURE 8

Inventories Ratio Analysis 2008 to 2013
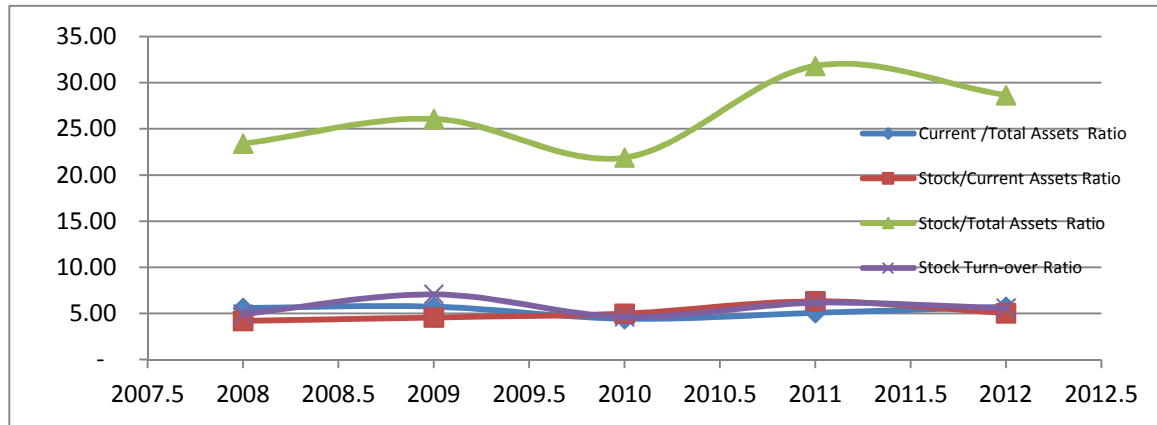
Source: Author, (2013)

Obsolescence -Write-off of inventory due to damage, evaporation, pilferage and loss such as from theft escalates the final costs of inventory. The researcher presumed a downward trend in losses due to obsolescence. (37.1%) of the respondents felt that there was increase of obsolescence in their stores, a significant (24.3%) felt that obsolescence had remained stable over the last five years and (38.6%) of respondents were of the opinion that obsolescence had decreased in their stores over the period. The researcher witnessed write-off of obsolete items on one of the major players (KP) and have noted a downward trend. Therefore, explaining why a few respondents indicated there was an increase in obsolescence.

Required Storage Space - Increase of demand for storage space is a strong indication of increase of inventories. It was anticipated that there was increase of demand for storage space. Majority (70%) of the respondents felt that there was increase of storage space in their stores, a significant minority (11.4%) felt that storage space had remained stable over the last five years and only a small portion of respondents (18.5%) were of the opinion that storage space had decreased in their stores over the period. The researcher witnessed increased

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demand for storage space in virtually all the warehouses in the form of rental of warehouses and congestion in the current warehouses. This confirms the initial position taken by the researcher.

Prices - Inability to control costs leads to escalation of prices. The product price trends therefore may be an indicator of cost trends. In the sector, the main products are service lines which supply electricity to customers and power tariffs which are the payments for electricity consumed. Asked to comment on the trend of these two, majority (51.5%) of the respondents felt that there was increase of quotation prices for service lines, a minority (34.3%) felt that quotation prices for service line had remained stable over the last five years and only a small portion of respondents (14.3%) were of the opinion that quotation prices for service line had decreased over the period.

Respondents may have been unsure of a sector price increase effected by one of the major players KP which has since been reversed by the government. On power tariffs, majority (54.3 %) of the respondents felt that there was increase of power tariffs, a minority 40% felt that power tariffs remained stable over the last five years and only a small portion of respondents (5.8%) were of the opinion that power tariffs had decreased over the period. A tariff increment proposal by the sector has since been refused by the government. It is evident that there is government subsidy on the price of service lines and government control on the power tariffs, thereby interfering with the free flow of forces of demand and supply in the market. This is a trend in many developing countries such as Egypt and South Africa, which subsidize the power sector to boost and protect their economies.

PBT (Profit Before Tax) - According to the audited financial reports for the ESS, the profits before tax have had a steady increase with an average rate of change of 1.464b shillings per annum, with correlation coefficient of 0.7401. Further, profit after tax also has increased over

the period under study with a rate of change of about 1.245b shillings per annum, (See table 19 below).

FIGURE 9

ESS Profitability Ratios Trend 2008- 2012.
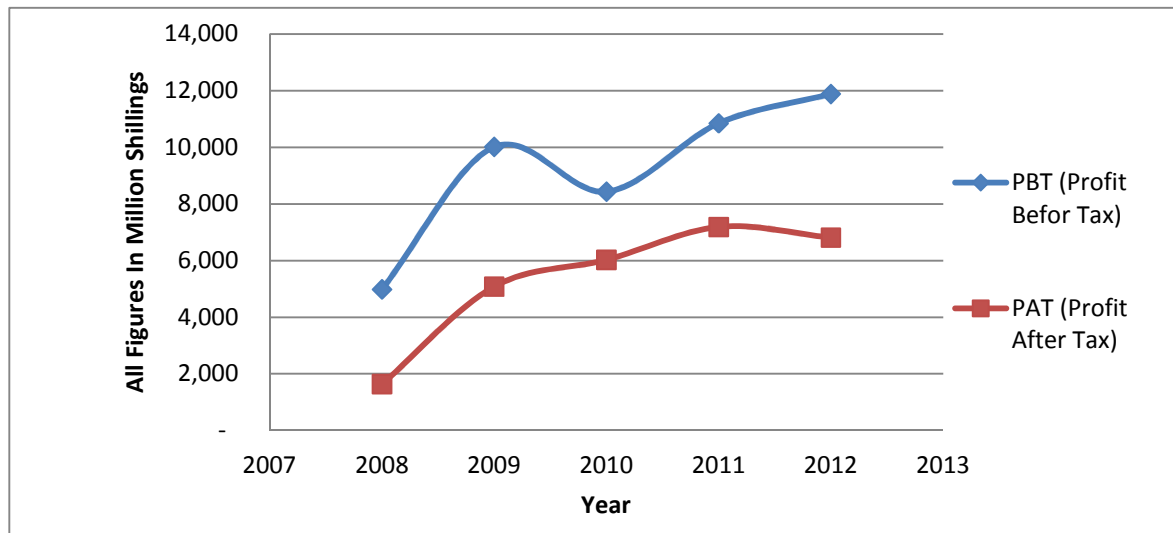
The relative rate of change for profit both before and after tax has been on an upward trend. (See figure 18 above) These findings confirm the opinion of respondents regarding overall performance of ESS, (question 6), where 79.54 % agreed that the company's overall performance has been rising.

ROA (Return on Assets %) for the ESS over the period under study averages at 3.59% with a SD of 0.91 at 0.05 confidence level. It is constantly below the inflation rate. Meanwhile, ROI (Return On Stock Investments %) on the other hand scores an average of 16.08% with a SD of 2.72 percentage points at 0.05 confidence level. This rate of return is above the inflation rate averaging at 12.91% with a very high SD of 7.56 at 0.05 confidence level. This implies that although the performance of the ESS is below par, ROI of the ILS is high and above the inflation rate, largely from good management of the stock by use of the ILS.

Total Assets - The ESS recorded a relatively steady growth of total assets from 177.67 to 350.76 billion over the period under study. The trend indicates a rate of change of 47,562b with a strong predictability of R squire of .9672. However, total inventories only increased from 7.59 b to 12.24 with a gradient of 1.202b worth of stock per year, though with a relatively low degree of predictability, R square of 0.6986. However, a closer look shows a more or less equal value between total current assets and turnover, indicating poor gearing proportions. The capacity to maintain a lower relative growth rate of inventories as compared to that of total assets, total current assets and total assets implies better management of inventories. This capability can be attributed to the ILS system, as an ERP system.

FIGURE 10

ESS Stock and other Assets - 2008-2012
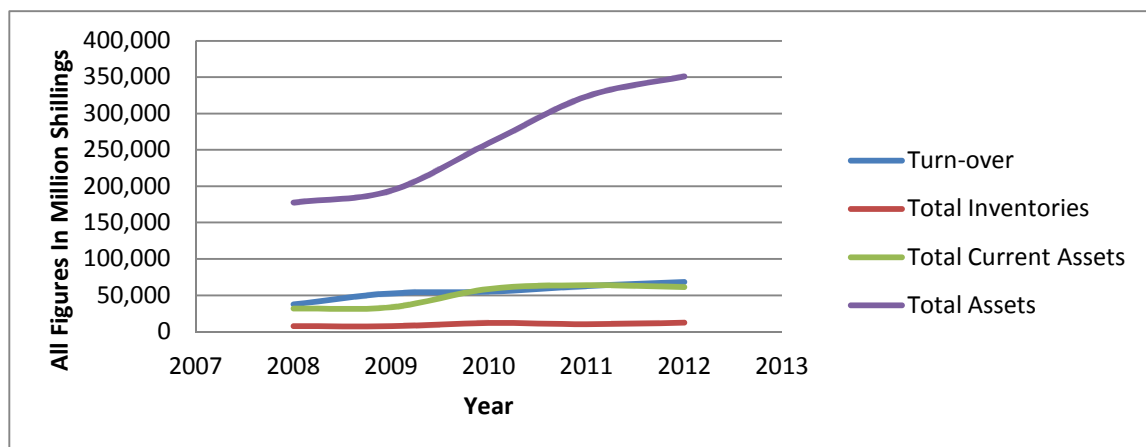
It is observed that inventory has the lowest gradient among the statistics below, indicating better management and control of inventories over the period under study, (see table 19 below), using ILS as management tool.

TABLE 18

ESS Inventory Relativity Statistics.

The table below shows the inventory statistics as compared to turnover, current assets, total assets, PBT and PAT.

Particular / Statistic	Gradient	Coefficient Correlation (R squire)	Closing Inventory Relativity	Gradient Relativity	Opening Inventory Relativity
	Million Ksh	No	No	No	No
Turn-over	7,143.00	0.9368	5.5797	5.9426	4.9432
Total Inventories	1,202.00	0.6986	1.0000	1.0000	1.0000
Total Current Assets	8,941.00	0.8006	5.0147	7.4384	4.1898
Total Assets	47,562.00	0.9672	28.6547	39.5691	23.3992
PBT (Profit Before Tax)	1,464.30	0.7401	0.9711	1.2182	0.6563
PAT (Profit After Tax)	1,245.00	0.7824	0.5565	1.0364	0.2691

Source: Author, (2013)

Turnover - The ESS recorded a relatively steady growth of turn-over from 37.53b to 68.30b over the period under study. The trend indicates a rate of change of 7. 143b per annum and R square (Correlation Coefficient) of .9368. However, total inventories only increased from 7.59 b to 12.24 with a much lower gradient, pointing to better management through ILS. Owing to high inflation rates averaging 11.17 % over the period under study, (see fig 11 below) increase in customer base and escalating maintenance costs, this project anticipated an increase in costs. However, trend of performance ratios was anticipated to more explicitly bring out the ILS impact on cost. In summary, the finding point that the ESS has to adopt what Walker and Wilson, (2012) refer to as an "aggressive integrated strategy" if they are to alleviate business tragedies due to escalating costs.

Inflation - According to KNBS, the inflation rate in Kenya was recorded at 6.02% in July 2013. It averaged 11.17 % from 2008 until 2013, reaching an all-time high of 31.50% in May 2008 and a record low of 3.18% in October 2010, (see figure 11 below).

FIGURE 11

Kenya Inflation Rate

KENYA INFLATION RATE
Annual Change on Consumer Price Index

SOURCE: WWW.TRADINGECONOMICS.COM | KENYA NATIONAL BUREAU OF STATISTICS
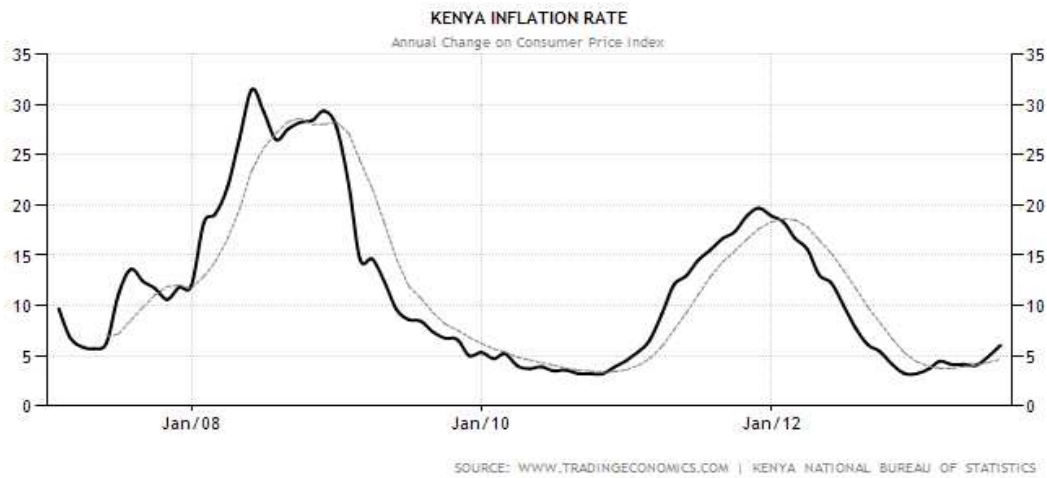
Source:KNBS, (2013)

In Kenya, the consumer price index (CPI) is based on expenditure of both urban and rural households. The ESS ROI (see figure 16 below) average is (16.08%) well above the inflation rate, implying that survival may be sustained into the future. However, the ESS ROA see figure12 below average is below the inflation rate (3.59%), indicating diminishing fortunes and value of the sector in the long run.

FIGURE 12

ESS Stock Trends

Source: Author, (2013)

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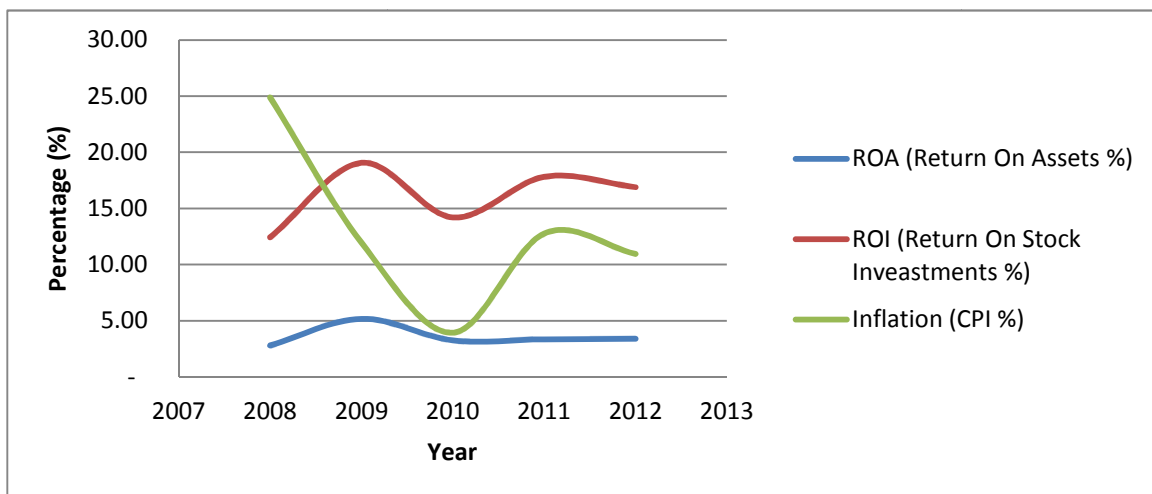
Though in a case of proper utilization of the ILS, relatively lower proportions may be recorded as compared to other types of costs. However, secondary data like ratio analysis may be necessary to establish clearly, a concrete position and direction. Figures best explain costs than opinion would. Generally, the opinions of the majority is that there has been increase in efficiency measures as well as in costs, However, inflation has also been very high over the period, according to KNBS, explaining the costs upward trend. Responses to particular subjects are discussed here below.

4.5.3   Cycle time Reduction

This research also sought to find out the impact of ILS as a critical factor for competitive advantage in reducing cycle time which relates to the strategy of speed. This is achieved by reducing activities cycle time to the minimum possible during the post-implementation adjustment period, what Oana, (2007) refers to as shakedown phase. To evaluate the presence and impact of ILS on cycle time reduction, ten minor questions were posed in the questionnaire. It was intended that the opinion expressed for all questions, individually and collectively would build a strong case to demonstrate the impact of ILS on cycle time. The theoretical framework proposed that reduction in cycle time would lead to better performance. Respondents' opinion on each of the ten aspects scrutinized relating to cycle time is now discussed below.

TABLE 19

Cycle Time Reduction

Indicator	SA		A		RO		D		SD	
	F	%	F	%	F	%	F	%	F	%
Reduced lead time	24	34.3	28	40	5	7.1	13	18.6	0	0
Reduced wait time	22	31.4	33	47.1	7	10	8	11.4	0	0
Reduced service time	20	28.6	34	48.6	10	14.3	6	8.6	0	0
Better utility of resources	18	25.7	33	47.1	9	12.9	9	12.9	1	1.4
Stock-outs	13	18.6	36	51.4	7	10	13	18.6	1	1.4
Increased stock turn-over	16	22.9	31	44.3	15	21.4	7	10	1	1.4
Order filling	20	28.6	33	47.1	9	12.9	7	10	1	1.4
Average time spent in warehouse	17	24.3	40	57.1	7	10	6	8.6	0	0
Order processing time	21	30	37	52.9	8	11.4	3	4.3	1	1.4
Cycle time reduction	19	27.1	29	41.4	13	18.6	8	11.4	1	1.4
Total	190	272	334	477	90	129	80	114	6	8.4
Average	19	27.2	33	47.7	9	12.9	8	11.4	0.6	0.8

Source Author, (2013)

FIGURE 13

Cycle Time Reduction
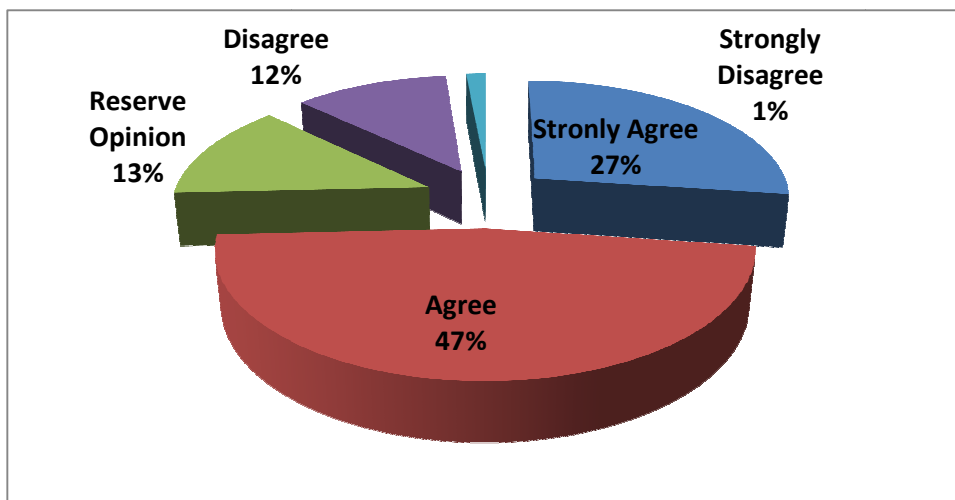
Source Author, (2013)

On average, 27% strongly agree that there was reduction in cycle time while 47% agree. 13% of the respondents reserved their opinion, however, a small 12% disagreed and

only 1% strongly disagreed. Therefore a majority of 74% at least agree that there was cycle time reduction. Detailed discussion of the perticular indicators follow here below.

Lead-time - Lead time is the waiting time between when an order for inventory replenishment is placed and the time the inventory is received. The longer the time, the more the stock holding to sustain production as the warehouse awaits replenishment. The study was investigating the nature of lead time. The ILS affords institutional resource planning facilities in its conceptual framework to minimize lead time to the bare minimum, thereby optimizing resources. Majority (74.3%) of the respondents agreed there is reduced lead-time over the last five years in their warehouses while a significant proportion of respondents (18.6%) disagreed and an insignificant minority (7.1%) reserved their opinions. Therefore, this study has clearly shown that the ESS has reduced lead time over the period under study.

Waiting-time - Time is a scarce resource and must not be spent idly. Customers waiting to be served should spend least or no time waiting. The ILS records, to the second, all transactions and even the length of time a user remains logged-on serving a customer. Users of the system are expected to review system reports and use them to manage and use time more economically. This research anticipated a strong case for reduced waiting time. Majority (78.5%) of the respondents agreed that average wait time has reduced over the last five years in their warehouses while a significant proportion of respondents (11.4%) disagreed. However, a minority (10%) reserved their opinion. Further, majority (77.4%) of the respondents agreed that there was decrease of average time spent in warehouse by customer over the last five years while an insignificant proportion of respondents (7.3%) disagreed and a significant minority (15.3%) reserved their opinions. The results above support initial assumptions of reduced waiting time and demonstrate that ILS has impacted positively on customer waiting time in the ESS.

Reduced service-time - Service time may be reduced by way of automation, order filling and processing efficiencies. The researcher encountered a good deal of mechanization and automation of processes during a preliminary visit to some warehouses and thereby expected substantial reduction in service time. Majority (77.2%) of the respondents at least agreed that average service-time has reduced over the last five years in their warehouses while an insignificant proportion of respondents (8.6%) only disagreed. However, a minority (14.3%) reserved their opinions.

Better utility of resources - Seventy two point eight of the respondents agreed there has been better utility of resources over the last five years in their warehouses while a significant proportion of respondents (14.3 %) disagreed and only (12.9%) reserved their opinions. The findings confirm positive impact and the researcher assumption that ILS has a huge capacity, if properly managed.

Stock-outs - Customer requests may not be fulfilled for lack of one or more items. This delays service and production, resulting to inefficiencies and opportunity costs due to time lost. The ILS affords tracking of stocks quantities and levels movement to avoid stock-outs. The researcher anticipated continuous reduction of stock-outs over time, owing to real-time data processing; 70.0 % of the respondents agreed stock-outs have reduced over the last five years in their warehouses while a significant proportion of respondents (20%) disagreed and a minority (10%) reserved their opinions.

On automation of processes majority (82.9%) of the respondents agreed there was increased automation of processes over the last five years in their warehouses while a significant (12.8%) disagreed and only (4.3%) reserved their opinions. Still, a majority (75.7%) of the respondents agreed that order filling takes less time over the last five years while an insignificant proportion of respondents (11.4%) disagreed and a minority (12.9%) reserved their opinions.

These findings clearly demonstrate that ILS has positively impacted cycle time in the ESS. Further, they concur with Sumantri and Lau (2011) that high logistics performance contributes to increased operational efficiency. Their paper identifies logistics service providers among key drivers on an economy. Organizations reduce activities cycle time by eliminating redundancies. The ILS provides necessary platform, time logs, rate of consumption and other statistical data to enable management to examine and redesign each process to make it more efficient, more flexible, and less expensive while maintaining or improving quality. This affords improving strategic focus by constantly making unique business choices which stand the test of competition over time enabling the business entity to survive and thrive.

SAP - ILS rating in enhancing overall performance

In evaluating the respondents' opinions of the overall performance of ILS in the ESS in the last five years, the respondents were asked to rate on a five point Likert-type scale their agreement with a number of the statements given.

TABLE 20

Enhancing Overall Performance

Indicator	SA		A		RO		D		SD	
	F	%	F	%	F	%	F	%	F	%
ILS has improve overall firm performance	25	35.7	40	57.1	3	4.3	2	2.9	0	0
Has enhanced economic benefits	27	38.6	37	52.9	3	4.3	3	4.3	0	0
Has increased customer connectivity	25	35.7	35	50	6	8.6	3	4.3	1	1.4
Has facilitated increase of return on investment	17	24.3	33	47.1	14	20	6	8.6	0	0
Has increase gross margin	14	20	30	42.9	13	18.6	13	18.6	0	0
Has increased profit margin	12	17.1	32	45.7	14	20	11	15.7	1	1.4
Suited for managing inventory in the company	35	50	29	41.4	5	7.1	1	1.14	0	0
Suited to propel the company to excellence	34	48.6	29	41.4	5	7.1	2	2.9	0	0
Total	189	270	265	379	63	90	41	58.4	2	2.8
Average	24	33.8	33	47.3	7.9	11.3	5	7.31	0.3	0.4

Source: Author (2013)

FIGURE 14

Overall view
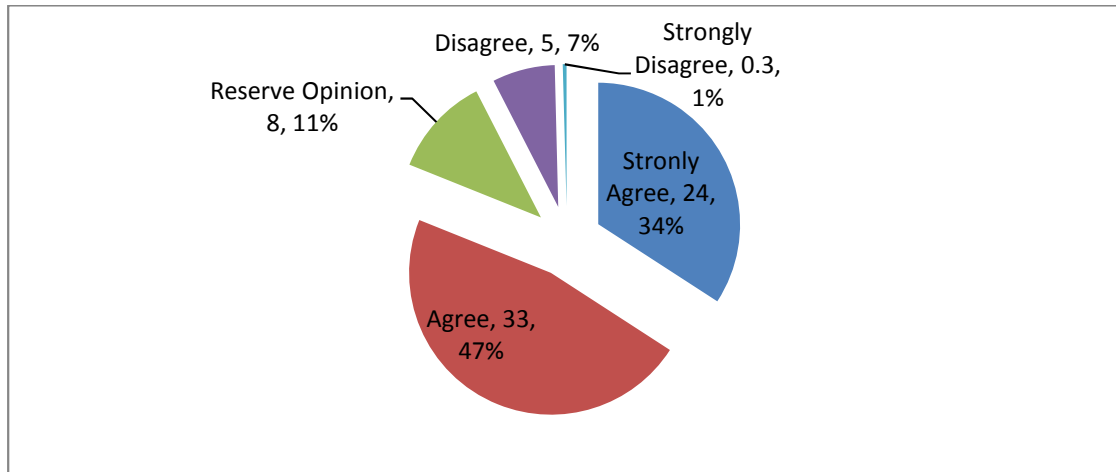
Source: Author (2013)

On average, 24.3% strongly agree that there was enhancement of overall view while 47% agree. 8.1% of the respondents reserved their opinion, however, a small 5.7% disagreed

and only 1% strongly disagreed. Therefore a majority of 71% at least agree that the overall view has been enhanced.

Respondents commented that ILS has improved overall firm performance in the period under study. As a consequence, this has enhanced the sub- sector's BEB, has increased customer connectivity thereby increasing ROI. Findings have also indicated that ILS has improved business practices and decision-making process, impacting favourably on both gross margin and profit margin. In a nutshell, ILS has facilitated achievement of strategic milestones and is very well-suited to managing inventory in the individual companies and best suited to propel the sector to excellence.

According to the audited financial reports for the ESS, the profits before tax have had a steady increase with an average rate of change of 1.464b shillings per annum, with correlation coefficient of 0.7401.

FIGURE 15

ESS Profit before Tax Trend For 2008 to 2012
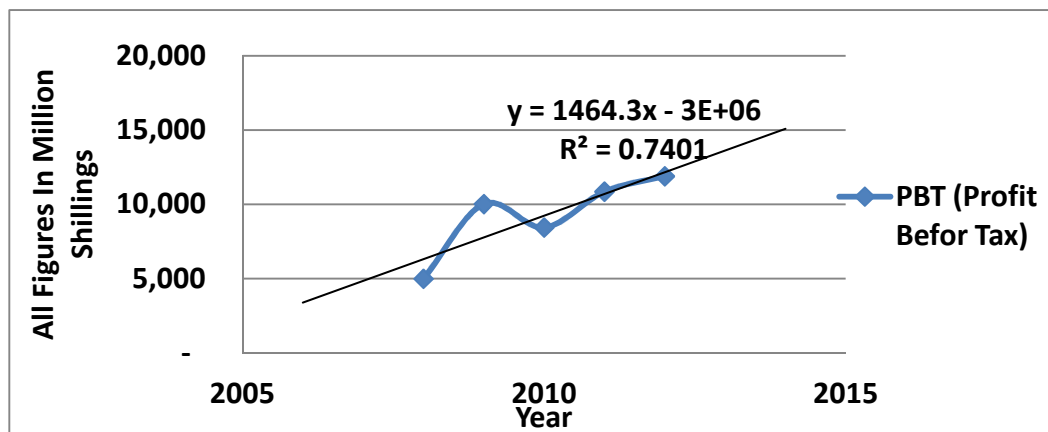
Source: Author (2013)

The ESS profit after tax indicates a positive trend, (See figure 15 above). These findings confirm the opinion of respondents regarding overall performance of ESS (see Fig 14), where majority (81 %) at least agreed that the company's overall performance has been

on an upward trend. However, ROA (Return on Assets) averages 3.59%, constantly below the inflation rate, (see figure 12 above).

On current/total assets ratio- The ESS recorded a negligible growth rate of (.04) current assets to total assets ratio with an average of 5.30 and a very weak coefficient of correlation at .0141 implying that the ratio is erratic and linear estimations to predict the ratio are weak. The stock/current assets ratio in the ESS recorded a growth rate of (0.34) with an average of 5.01 and a coefficient correlation at 0.4514 implying that linear estimations to predict the ratio is only fairly reliable. The ESS recorded a growth rate of 1.62 times per annum of stock/total assets ratio, with an average of 26.37 and a coefficient of correlation at 0.4129 implying that linear estimations to predict the ratio is fairly reliable.

FIGURE 16

ESS Percentage Ratios
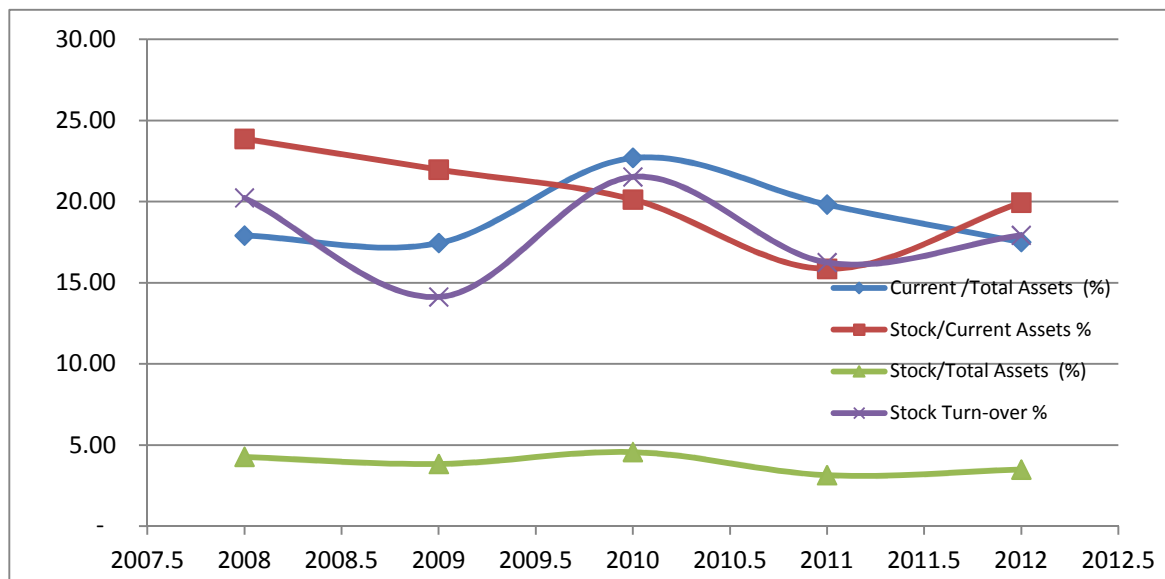
Source: Author (2013)

Percentage of current assets to total assets - Over the 5 year period under review, current /total assets (%) average 19.08 SD 2.24 at 0.05 confidence level. Increasing at a of 0.1566

percentage points per annum with a weak correlation coefficient of 0.0122, meaning that the ration is erratic.

Stock/current assets trend is a vital indicator of stock management. The researcher anticipated a downward trend. Stock/current assets % average 20.35 with SD of 2.98 at 0.05 confidence level. Decreasing at a rate of 1.3963 percentage points per annum with a correlation coefficient of 0.5504, meaning that the ratio is fairly stable and not erratic. These findings confirm the view of the researcher and are a very strong indication that stocks are being managed much better in relation to the other current assets. It is a strong positive contribution of the ILS in stock management.

The stock/total assets (%) average at 3.86 with a SD of 0.58 at 0.05 confidence level. Increasing at a rate of 0.2257 percentage points per annum with a correlation coefficient of 0.3849, meaning that the ratio is not very erratic. On the other hand, stock turnover (%) average 18.01 SD 2.98 at 0.05 confidence level. Increasing at a rate of 0.2485 percentage points per annum with a weak correlation coefficient of 0.0174, meaning that the linear ratio is erratic, (see table 19).

4.6   *Multiple regression analysis*

Further, the researcher conducted multiple regression analysis so as to establish the relationship between various dimensions of performance BEB in the ESS operationalized as indicated on table 2.15 above. All the indicators of the variables were used in measuring the variable. Multiple regression is a statistical technique that allows us to predict the score of one variable on the basis of their scores on several other variables. The main purpose of multiple regression analysis is to enable us to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. The researcher conducted multiple regression analysis in terms of how quality customer service,

cost reduction and cycle time reduction as dependent variables relate to independent variables - quality of management practice (QMP), resource activation level (RAL), and capability level (CL).

4.6.1 Reliability Statistics

Reliability is an essential component of validity. It describes the repeatability and consistency of a test. It was tested by use of Cronbach's Alpha analysis whenever a Likert – type scale was used, (see also appendix v).

TABLE 21

Reliability Statistics

Reliability: internal consistency of	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Action
Quality of management practices	.834	.837	8	Accept
Resource activation level	.597	.596	3	Reject/Improve
Cycle time reduction	.911	.913	10	Accept
Capability Levels	.700	.706	2	Accept
Overall performance	.901	.903	7	Accept
Cost reduction	.294	.276	11	Reject/Improve
Customer service	.846	.854	6	Accept

Source: Author, (2013)

As a measure of internal consistency, a score of between 0.70 and 1 is normally acceptable, and the study may rely on and use the questionnaire, Tavakol & Dennick, (2011), otherwise if the score is below 0.7, the questionnaire may not be used before it is improved. The results of the research in the case of cost reduction remain questionable. However, the study proceeded on to use the outcome of the alpha factor as an academic pursuit, to see how the results will relate to those of the factors found acceptable.

4.6.2 *Prediction of business economic benefits occasioned to quality of customer service*

Pursuant to the first objective, a regression analysis was done, using quality of management practice, resource activation level and capability level as predictors of business economic benefits brought about to quality of customer service. The finding are given below.

TABLE 22

Prediction of Business Economic Benefits Accrued to Quality of Customer Service:

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.065	2.241		1.368	.176
	Quality of management practice	.289	.062	.507	4.687	.000
	Resource activation level	.301	.151	.205	1.996	.050
	Capability level	.274	.214	.124	1.277	.206

a. Dependent Variable: Quality of customer service
Source: Author, (2013)

The regression equation $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$ now becomes: (2)

$Y = 3.065 + 0.507\ X_1 + 0.205 X_2 + 0.124 X_3$

Where: Y = BEB- quality customer service (Dependent variable)

                      X_1 = Quality of management practice

                      X_2 = Resource activation level

                      X_3 = Capability level

TABLE 23

Prediction of Business Economic Benefits Occasioned to Customer Service:

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	359.876	3	119.959	20.614	.000[b]
	Residual	384.067	66	5.819		
	Total	743.943	69			

a. Dependent Variable: quality of customer service
b. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice
Source: Author, (2013)

F (3, 66) =20.614, 000< 0.05 therefore the regression is significant

TABLE 24

Prediction of Business Economic Benefits Occasioned to Quality of Customer Service:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.696[a]	.484	.460	2.41230

a. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice
b. Dependent Variable: Quality of customer service
Source: Author, (2013)

The variables have a correlation R of 0.696 and a correlation coefficient of determination (R-square) at 0.484, meaning that the three predictors account for only 48.4% of the variability of the dependent variable.

According to the regression equation established, holding all factors: Quality of management practice (QMP), resource activation level (RAL), and capability level (CL) constant, quality customer service in the ESS would be 3.065. Further, data findings analyzed indicate that a unit increase in QMP lead to a 0.507 increase in quality customer service, holding all other independent variables constant. A unit increase in RAL will lead to a 0.205

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increase in quality customer service and a unit increase in CL will lead to a 0124 increase in quality customer service in the ESS. These results infer that quality of management practice (QMP) and resource activation level (RAL) are significant predictors while capability level (CL) is not. These findings concur with those of Flynn, et al., (2007) who by use of multiple regression analysis established that quality management practices as defined by quality of decision making and quality of internal operations are vital components for gaining business economic benefits.

4.6.3 *Prediction of business economic benefits occasioned to cost reduction*

Pursuant to the second objective, a regression analysis was done, using quality of management practice, resource activation level and capability level as predictors of cost reduction. The findings are given below.

TABLE 25

Prediction of Business Economic Benefits Occasioned to Cost Reduction:

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.234	4.008		7.792	.000
	Quality of management practice	.137	.110	.183	1.238	.220
	Resource activation level	-.392	.270	-.203	-1.452	.151
	Capability level	-.014	.384	-.005	-.035	.972

 a. Dependent Variable: Reduced cost
Source: Author, (2013)

The regression equation $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$ now becomes: (3)

$Y = 31.234 + 0.183 X_1 - 0.203 X_2 - 0.005 X_3$

Where: **Y** = BEB-reduced costs (Dependent variable)

X_1 = Quality of management practice

X_2 = Resource activation level

X_3 = Capability level

TABLE 26

Prediction of Business Economic Benefits Occasioned to Cost Reduction:

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	47.644	3	15.881	.853	.470[b]
1	Residual	1228.698	66	18.617		
	Total	1276.343	69			

a. Dependent Variable: reduced cost
b. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice
Source: Author, (2013)

$F_{(3, 66)} = 0.853$, $0.470 > 0.05$ therefore the regression is insignificant.

TABLE 27

Prediction of Business Economic Benefits Occasioned to Cost Reduction:

Coefficients

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.193[a]	.037	-.006	4.31470

a. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice
b. Dependent Variable: Reduced cost
Source: Author, (2013)

The variables have a correlation R of 0.193 and a correlation coefficient of determination (R-square) at 0.037, meaning that the three predictors account for only 3.7% of the variability of the dependent variable.

According to the regression equation established, holding all factors: Quality of management practice (QMP), resource activation level (RAL), and capability level (CL) constant, cost reduction in the ESS would be 31.234. Further, data findings analyzed indicate

that a unit increase in QMP lead to a 0.183 increase in cost reduction, holding all other independent variables constant. A unit increase in RAL will lead to a -0.203 increase in cost reduction and a unit increase in CL will lead to a - 0.005 increase in cost reduction in the ESS. These results infer that only quality of management practice (QMP), is a significant predictor. The findings agree with those of Flynn, et al., (2007) who by use of multiple regression analysis established that quality management practices as defined by quality of decision making and quality of internal operations are vital components for gaining business economic benefits. The results may also be interpreted in the light of Gavins eight dimensions of quality, (Garvin 1991) where we find concurrence.

4.6.4 *Prediction of business economic benefits occasioned to cycle time reduction*

Pursuant to the third objective, a regression analysis was done, using quality of management practice, resource activation level and capability level as predictors of cycle time reduction. The findings are given below.

TABLE 28

Prediction of Business Economic Benefits Occasioned to Cycle Time Reduction: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.907	4.287		-.678	.500
	Quality of management practice	.551	.118	.443	4.665	.000
	Resource activation level	1.087	.288	.339	3.768	.000
	Capability level	.933	.410	.194	2.274	.026

 a. Dependent Variable: cycle time reduction
Source: Author, (2013)

The regression equation $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$ now becomes: (4)

$Y = -2.907 + 0.443 \ X_1 + 0.339X_2 + 0.194X_3$

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Where: Y = BEB-Cycle time reduction (Dependent variable)

X_1= Quality of management practice

X_2 = Resource activation level

X_3 = Capability level

TABLE 29

Prediction of Business Economic Benefits Occasioned to Cycle Time:

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	2137.641	3	712.547	33.461	.000[b]
1	Residual	1405.445	66	21.295		
	Total	3543.086	69			

a. Dependent Variable: cycle time reduction
b. Predictors: (Capability level, Resource activation level, Quality of management practice
Source: Author, (2013)

$F (3, 66) =33.461$, 000< 0.05 therefore the regression is significant.

TABLE 30

Prediction of Business Economic Benefits Occasioned to Cycle Time Reduction:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.777[a]	.603	.585	4.61461

a. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice
b. Dependent Variable: cycle time reduction
Source: Author, (2013)

The variables have a correlation R of 0.777 and a correlation coefficient of determination (R-square) at 0.603, meaning that the three predictors account for only 60.3% of the variability of the dependent variable.

According to the regression equation established, holding all factors: Quality of management practice (QMP), resource activation level (RAL), and capability level (CL) constant, cycle time reduction in the ESS would be -2.907. Further, data findings analyzed indicate that a unit increase in QMP lead to a 0.443 increase in cycle time reduction, holding all other independent variables constant. A unit increase in RAL will lead to a 0.339 increase in cycle time reduction and a unit increase in CL will lead to a 0.194 increase in cycle time reduction in the ESS. These results infer that quality of management practice (QMP), resource activation level (RAL), and capability level (CL) are all significant predictors. The findings agree with those of Flynn, et al., (2007) who by use of multiple regression analysis established that quality management practices as defined by quality of decision making and quality of internal operations are vital components for gaining business economic benefits. The results may also be interpreted in the light of Gavins eight dimensions of quality, Garvin (1991) with whom these findings concurred.

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1   *Introduction*

This chapter presents the summary, conclusion and recommendations based on the findings of the study. The summary presents data aimed at answering the research questions the study set out to pursue. Information technology interests management mostly because of its unique capability to increase capacity while simultaneously reducing costs. Integration of Logistics Systems have become necessary to counter competition, stiffening mainly due to globalization. ILS having catapulted the Asian tigers to success attracted developing countries like Kenya. With heavy investment in ILS, it was the aim of this study to find out the impact of ILS on effective management of inventory in the ESS in Kenya.

Available literature indicates that ILS as a branch of SCM is quickly gaining prominence, more so in developed countries, prompting developing and poor countries to take the qua. Despite many failures, ILS has impacted positively on numerous organizations, as an ERP tool.

The descriptive method was adopted in this study; non- experimental design was adopted with a statistical topical scope, where inference from sample is made about the population. The target population consisted of all those ESS staff in management who use the ILS and are located in Nairobi. Non-probabilistic sampling design was employed where primary and secondary data were sought. A questionnaire was used as a research instrument. The scientific research method was consistently employed to assure quality control while SPSS tool was used in data analysis.

This study set out to assess the impact of the Integrated Logistics System (ILS) on effective management of inventory in the electricity sub-sector in Kenya. Opinion of owners, users and customers of the ILS in relation to quality warehouse customer service delivery,

reducing costs and cycle time were sought. ILS was measured in terms of quality of management practices, resource activation level and capability level. While structured questionnaires were administered to a sample, two managers were also interviewed. Further, examination of audited financial statements was considered vital among other secondary data.

5.2   *Summary of Findings*

Demographics indicate a well-educated, experienced, informed and trained management staff, who interacts regularly with the ILS, the subject matter in the ESS. Less than thirty percent warehouses hold more than eighty percent of the ESS inventories value. Majority of employees are male and most of the employees are between thirty and fifty years of age. There was a good spread of respondents between users and customers of the ILS in the ESS. These findings agree both with nature of interaction and what the research found on the ground. The data provide a clear indication that majority of the respondents had served in the ESS for at least the whole of the period under study, expectedly gaining necessary experience to be best placed to express an opinion on ILS impact in the warehouses. Further, it was clearly demonstrated that the number of stock items managed by the ILS is over 6,000.

Findings of the regression analysis are summarised in table 33 below. Pursuant to the first objective, It is notable that quality management practice (QMP) has impacted positively on all dependent variables - quality customer service, cost reduction and cycle time reduction. It is, therefore a significant factor.

Table 33

Regression Analysis per Objective

Predictor \ Dependent	Cycle Time Reduction (CTR)	Quality Customer Service (QCS)	Cost Reduction (CR)
Quality Management Practice (QMP)	Significant	Significant	Significant
Resource Activation Level (RAL)	Significant	Significant	Not Significant
Capability Level (CL)	Significant	Not Significant	Not Significant

Source: Author, (2013)

That quality management practice, resource activation level and capability level have significantly impacted cycle time. The sector needs to propagate resource activation and capability levels so as to be able to reduce costs. That capability levels need to be enhanced so as to improve quality of customer service and to reduce costs.

Therefore, in our endeavor to find out the extent to which quality ILS management practice impact BEB in terms of customer service in the sub-sector, the study finds quality of management practice having significant impact, resource activation level also having significant impact while capability level's impact was not significant. It is therefore necessary for the sub-sector to enhance capability level so as to unleash full potential of customer service.

In the second objective, this study sought to determine the extent to which ILS resource activation level influences BEB in form of cost reduction in the sub-sector. Although resource activation level does not significantly influence cost reduction, it does however significantly influence quality customer service and cycle time reduction.

In the third objective where the study sought to explore the extent to which ILS capability levels influence BEB in terms of cycle time reduction in the sub-sector, the study revealed that capacity level has significant influence to predict cycle time reduction. However, it is neither significant on quality customer service nor on cost reduction.

Findings from audited financial statements concurred that there was gradual improvement on inventory management. Relative stock levels have continued to reduce over time despite tremendous increase in activity levels, country electricity connectivity cover and inflation.

5.3 Conclusions

The study concludes that the ILS has a major impact on the effective management of inventory in the ESS in Kenya. In particular, The study concludes that quality management practice has impacted positively on quality customer service, cost reduction and cycle time reduction. Therefore quality management practice is a significant factor influencing the three variables. Further, that quality management practice, resource activation and capability level have significantly impacted cycle time. The sector needs to propagate resource activation and capability levels so as to be able to reduce costs. That capability levels need to be enhanced so as to improve quality of customer service and to reduce costs. Generally, ILS has had important positive impact on quality customer Service, given that both quality management practice and resource activation level, are its significant predictors. However, capability level need to be improved in this regard. In regard to the impact of ILS on achieving cycle time reduction, it is the findings of the study that quality management practice, resource activation level and capability level are vital factors of cycle time and have significantly impacted cycle time reduction in the ESS.

5.4 Recommendations

5.4.1 Recommendations for policy

To have even more effective management of inventory by use of ILS, There is need to recognize quality management practice, resource activation level and capability level as factors influencing BEB in the sector. It is imperative to improve capability level of ILS on both quality customer service and cost reduction, also improve resource activation level to

impact on cost reduction. Issues such as customer service feedback mecanisim, measuring customer turn-over, sharing of services to enhance internal and vertical integration are cases in point where improvement may add BEB when enhanced. There are areas, therefore, where ILS resource need to be enhanced in terms of quality management practice, resource activation level and capability level, so as to effectively manage customer service, costs and cycle time, to afford business economic benefits for the sector.

5.4.2   *Recommendations for further studies*

A similar study with a wider scope to cover the energy sector may be considered, to enlarge the body of knowledge in this area. Further, while this paper focused on indictators of effectiveness including improving operational level, improving customer service and reducing cost, other indicators of effectiveness possibly requiring research may incorporate accessing resources, focusing on core business, increasing market share, improving business performance, and developing business network capabilities.

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Appendix i: Letter to Respondents

<div align="right">

Electricity Sub-Sector,
P.O Box 30099 00200,
Nairobi.
</div>

Dear Respondent,

I am an employee of Kenya Power, currently pursuing master's program in corporate management at school of graduate studies, at KCA University.

I am conducting a research on the impact of the Integrated Logistics System (ILS) in the Electricity Sub-Sector warehouses in Kenya. The objective of my study is to evaluate the impact occasioned by implementation of ILS, a module in SAP. The outcome of my research will be very useful to the sub-sector.

I have identified you to participate in this study, and therefore request you to kindly complete this questionnaire as objectively as possible. All the information i get from you will be treated as confidential and will be used only for this study.

Kindly note that you are free to withdraw at any level before conclusion of the study.

Jackson N. Waweru

Signature ……………………………………..

Thank you.

Appendix ii: Questionnaire

Section A : Personal Profile

1. Gender: Male {   }   Female {   }

2. Your age bracket (Years).

18-30	31- 40	41-50	51-60	Above 60

3. Your highest level of education.

University	Polytechnic/ college	Secondary	Primary school	Other (specify)

4. Nature of interaction with ILS: Warehouse – in - charge {. } Warehouses operative {.. } Customer {..}

5. How often do you use or refer to ILS?. Please indicate as appropriate.

Daily	Weekly	Rarely	Never	Other, Specify

6. Name of your Organization/Unit/ Department/ Warehouse/ Warehouse (Optional):

7. Wage bracket (optional)

Monthly gross salary "000" Ksh	50 & Below.	51-100	101- 150	151-200	201+

8. How long have you been in the organization? Tick as appropriate.

5 years and below	6 – 10 Years	11 – 15 Years	Above 15 Years

Section B : Integrated Logistics System (ILS)

9. Current value of stock in your warehouse in Ksh. (Indicate as appropriate)

Below 500,000	0.5 to 1 Billion	Above 1 to 3 Billion	Above 3 below 5 Billion	Above 5 Billion

10. Number of Stock Items(Material Codes) in your warehouse (Indicate as appropriate)

Below 500	501 to 2,000	2,001 to 4,000	4,001 to 6, 000	Above 6, 000

SECTION C : Quality Management Practices

11. Quality of Internal operations

Since the introduction of SAP - ILS system for inventory management, what is your opinion on the following statements regarding your warehouse service delivery improvement? Mark √ as appropriate.

N.B SA- Strongly Agree, A- Agree, RO Reserved Opinion , D Disagree, SD- Strongly Disagree

3	Statement	SA	A	RO	D	SD
a	Facilitated achievement of strategic milestones					
b	Customer feed-back mechanism has improved.					
c	There is business process reengineering (BPR).					
d	ILS upgrading					
e	ILS training					
f	Has Improve business practices					
g	Has improved decision making					

12. Quality of Internal Operations

Since the introduction of SAP - ILS system for inventory management, what is your opinion on the following statements regarding your warehouse service delivery improvement? Mark √ as appropriate.

No.	Statements	Yes	No
1	Do you sign performance targets with subordinates?		
2	Do you sign performance targets with manager?		
3	As parastatals, do you observe the PPOA requirements?		
4	Does your manager sit in BOD?		
5	Do you have customer feedback mechanism?		
6	Do you meet user demand		
7	Do you have a mechanism for meeting emergency needs?		

8	Do you have a system to monitor customer turn-over?		
9	Do you have a stand-by staff at night?		

SECTION D ACTIVITY LEVELS

13.After the introduction of SAP - ILS for inventory management, what is your opinion on

the following statements regarding cycle-time reduction? Mark √ as appropriate

	Statement s on activity Levels	SA	A	RO	D	SD
a	3rd Party contractors have increased many folds					
b	Achieved on line real time processing					
c	Automated process					

14. To what degree do you associate the integrated concept to the two statements?

	Statements on Internal dynamics	Very High A	High A	No Opinion	Low A	Very A
a	Association of integrated concept with organization structure					
b	Association of integrated concept with organization structure					

Section E: Performance Business Economic Benefit

15. Since the introduction of SAP - ILS system for inventory management, what is your opinion on the following statements regarding your warehouse service delivery improvement? Mark √ as appropriate.

N.B SA- Strongly Agree, A- Agree, RO Reserved Opinion , D Disagree, SD- Strongly Disagree

	Statements	SA	A	RO	D	SD
a.	Customer complaints have reduced					
b.	Customer positive feedback has been increasing					
c.	Customer responsive score has been increasing					
d.	Customer has been he concern of top management					
e.	Team talk in the warehouse discuss service delivery improvement					

16. After the introduction of SAP - ILS for inventory management, what is your opinion on the following statements regarding cycle-time reduction? Mark √ as appropriate

		Sharp increase	Small Increase	Stable	Small Decrease	Sharp Decrease
1.	Total stock holding					
2.	Overall Division Performance					
3.	Cost of working capital					
4.	Moving average Price					
5.	Moving Average price (MAP)					
6.	Inventory turnover,					
7.	Obsolescence					
8.	Required storage space					
9	Quotation prices for service-lines					
10	Power tariffs					

Section F: Cycle Time Variation

17. After the introduction of SAP - ILS for inventory management, what is your opinion on the following statements regarding cycle-time reduction? Mark √ as appropriate

		Strongly agree	Agree	Reserve opinion	Disagree	Strongly disagree
a	Reduced lead-time.					
b	Reduced wait time.					
c	Reduced service time.					
e	Better utility of resources.					
f	Stock-outs have reduced.					
h	Automated processes.					
j	Increased stock turn-over.					
k	Order filling takes less time.					

Section G: Overall Performance

18. After the introduction of SAP - ILS for inventory management, what is your opinion on the following statements regarding cycle-time reduction? Mark √ as appropriate

6		SA	A	RO	D	SD
a	ILS has improved overall firm performance.					
b	Has enhanced economic benefits.					
c	Has increased customer connectivity.					
d	Has facilitated increase of Return on Investment (ROI).					
e	Has increased gross margin.					
f	Has increased profit margin.					
g	SAP - ILS is suited to managing inventory in the company.					
h	SAP - ILS is suited to propel this company to excellence.					

19. How successful has the warehouse been in each of the following areas?
NB. VS- Very Successful, S- Successful , NO -No Opinion Un-Successful, VUS- Very

Unsuccessful

	Mark As Appropriate	VS	S	NO	US	VUS
1.	Improving Customer Service					
2	Reducing Costs					
3	Cycle Time Reductions					

Thank you for your cooperation

Appendix iii: Electricity Sub-Sector Stock Statistics From 2008 to 2012

Table 1.1 Electricity Sub-Sector Stock Statistics For 2008 To 2012

Year	All Figures In Million Shillings				
	2012	2011	2010	2009	2008
Turn-over	68,301	62,578	55,029	52,690	37,529
Total Inventories	12,241	10,166	11,843	7,439	7,592
Total Current Assets	61,385	64,125	58,844	33,863	31,809
Total Assets	350,762	323,455	259,263	194,065	177,647
PBT (Profit Before Tax)	11,887	10,851	8,435	10,016	4,983
PAT (Profit After Tax)	6,812	7,187	6,027	5,081	6,043

Table 1.2 Electricity Sub-Sector Stock Ratios 2008 to 2012

Year	2012	2011	2010	2009	2008
Current /Total Assets Ratio	5.71	5.04	4.41	5.73	5.58
Stock/Current Assets Ratio	5.01	6.31	4.97	4.55	4.19
Stock/Total Assets Ratio	28.65	31.82	21.89	26.09	23.40
Stock Turnover Ratio	5.58	6.16	4.65	7.08	4.94
Current /Total Assets (%)	17.50	19.83	22.70	17.45	17.91
Stock/Current Assets %	19.94	15.85	20.13	21.97	23.87
Stock/Total Assets (%)	3.49	3.14	4.57	3.83	4.27
Stock Turn-over %	17.92	16.25	21.52	14.12	20.23
ROA (Return On Assets %)	3.39	3.35	3.25	5.16	2.80
ROI (Return On Stock Investments %)	16.89	17.82	14.19	19.06	12.42
Inflation (CPI %)	10.96	12.77	3.94	11.97	24.88

Table 1.3 Electricity Sub-Sector Stock Statistics Per Company For 2008 To 2012

Year	All Figures In Million Kenya Shillings				
	2012	2011	2010	2009	2008
Kenya Power					
Turnover	45,007	42,485	39,107	36,458	23,917
Inventories per Balance Sheet	10,286	8,960	9,926	6,655	6,578
Total current assets	28,159	35,150	21,000	20,342	20,755
Total assets	134,131	119,878	91,648	70,648	59,812
PBT	8,506	6,254	5,632	5,674	3,522
PAT	4,617	4,219	3,716	3,225	1,764
KenGen Stock Levels					
Turnover	15,999	14,389	10,998	12,652	11,548
Inventories per Balance Sheet	1,955	1,168	1,443	750	985
Total current assets	22,288	19,539	32,599	12,748	10,655
Total assets	163,000	161,000	136,641	102,736	99,408

PBT	4,045	3,651	2,413	4,556	3,078
PAT	2,882	2,080	1,957	2,070	5,896
KETRACO Stock Levels					
Turnover	315	280	647	-	-
Inventories per Balance Sheet	-	-	-	-	-
Total current assets	7,145	6,659	3,568	-	-
Total assets	28,743	18,986	8,760	-	-
PBT	57	479	424	-	-
PAT	34	421	388	-	-
REC Stock Levels					
Turnover	6,980	5,424	4,277	3,580	2,064
Inventories per Balance Sheet	0	38	474	33	28
Total current assets	3,793	2,777	1,677	773	399
Total assets	24,888	23,591	22,214	20,681	18,427
PBT	(721)	467	(34)	(214)	(1,617)
PAT	(721)	467	(34)	(214)	(1,617)

Appendix iv: Trend of Total Stock Holding

Trend Of Total Stock Holding	Sharp Increase		Small increase		Stable		Small decrease		Sharp decrease	
Statement	f	%	f	%	F	%	f	%	f	%
Total stock holding in your warehouse	40	62.5	11	17.2	10	15.6	1	1.6	0	0
Overall divisional performance	26	40.6	16	25.0	18	28.1	3	4.7	0	0
Cost of working capital	20	31.2	23	35.9	9	14.1	4	6.2	5	7.8
Moving average price (MAP)	15	23.4	24	37.5	20	31.2	1	1.6	1	1.6
Efficiency	23	35.9	24	37.5	8	12.5	2	3.1	3	4.7
Inventory turnover	19	29.7	22	34.4	14	21.9	6	9.4	0	0
Obsolescence	15	23.4	16	25.0	13	20.3	11	17.2	6	9.4
Required storage space	20	31.2	24	37.5	8	12.5	4	6.2	6	9.4
Quotation prices for service line	19	29.7	17	26.6	20	31.2	4	6.2	2	3.1
Power tariffs	14	21.9	27	42.2	14	21.9	2	3.1	1	1.6
TOTAL	**211**	**329.5**	**204**	**318.8**	**134**	**209.3**	**38**	**59.3**	**24**	**37**
MEAN	**21.1**	**32.95**	**20.4**	**31.18**	**13.4**	**20.93**	**3.8**	**5.93**	**2.4**	**3.7**

Appendix v: List of warehouses and their value

NO	WAREHOUSE	VALUE
1	Nairobi South St	3,455,263,435.18
2	Likoni Rd Store	1,541,229,976.96
3	Isiolo Rd Store	249,467,629.35
4	Bulk Store	924,331,475.79
5	Ruaraka Store	1,540,473,326.56
6	Dagoretti store	45,099,728.73
7	Machakos store	38,077,689.28
8	Roysambu Store	41,955,326.53
9	Meters store	23,410,940.22
10	Meter Test store	2,596,086.01
11	KenGen	1,955,000,000.00
12	REC	427,000.00
13	KETRACO	0.00
	KPLC	9,817,332,614.6
	ESS Stock	12,241,427,000
	Percentage	80.20

Reliability: internal consistency of quality of management practices

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.834	.837	8

Item Statistics

	Mean	Std. Deviation	N
Achieving strategic milestones	3.9429	.84931	70
Customer feedback mechanism	4.1286	.74057	70
Business Processes Reengineering	3.8857	.90958	70
Frequent ILS upgrading	4.0571	.72002	70
Frequent ILS training	3.6000	.93870	70
Team talk	3.6571	1.11493	70
Improved Business practices	4.2286	.70549	70
Improved decision making	3.9429	.94617	70

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Achieving strategic milestones	27.5000	16.717	.751	.589	.789
Customer feedback mechanism	27.3143	19.610	.381	.285	.834
Business Processes Reengineering	27.5571	18.656	.404	.347	.835
Frequent ILS upgrading	27.3857	18.559	.577	.468	.814
Frequent ILS training	27.8429	15.960	.775	.636	.783
Team talk	27.7857	16.866	.496	.443	.828
Improved Business practices	27.2143	18.924	.527	.358	.819

Improved decision making	27.5000	16.775	.643	.463	.802

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
31.4429	22.656	4.75984	8

Reliability: internal consistency of Resource activation level

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.597	.596	3

Item Statistics

	Mean	Std. Deviation	N
Third party contractors	4.1143	.98603	70
On-line-real-time processing	3.8286	1.02110	70
Automation of processes	4.0286	.99231	70

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Third party contractors	7.8571	2.965	.309	.095	.632
On-line-real-time processing	8.1429	2.472	.458	.236	.417
Automation of processes	7.9429	2.547	.459	.235	.418

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
11.9714	4.985	2.23264	3

Reliability: internal consistency of Capability Levels

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.700	.706	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Association ILS with Information Systems	4.1286	.838	.546	.298	.
Association of ILS with organization structure	4.2571	.600	.546	.298	.

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
8.3857	2.211	1.48707	2

Reliability: internal consistency of Cycle time reduction

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.911	.913	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
lead-time	34.9857	39.840	.760	.746	.897
waiting time	34.9000	41.251	.763	.793	.897
service time	34.9143	42.398	.709	.700	.901
utility of resources	35.0571	41.475	.683	.652	.902
Stock outs	35.2143	44.026	.457	.295	.916
stock turnover	35.1143	42.364	.641	.544	.905

Order filling	34.9714	40.550	.794	.774	.895
time spent in warehouse	34.9143	43.790	.622	.671	.906
Order processing time	34.8286	42.492	.735	.763	.900
Cycle time reduction	35.0714	41.835	.649	.626	.904

Reliability: internal consistency of Overall performance

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.901	.903	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ILS and performance	24.6714	16.079	.637	.655	.894
enhanced economic benefits	24.6714	15.093	.760	.745	.881
customer connectivity	24.7857	14.171	.788	.630	.877
ROI Return on investments	25.0571	13.968	.792	.668	.876
gross margin	25.2857	13.685	.708	.571	.890
Suited to managing inventory in ESS	24.5286	15.934	.649	.750	.893
Suited to Propel Sector to excellence	24.5714	15.524	.667	.770	.891

Reliability: internal consistency of Cost reduction

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.294	.276	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Increased stock holding	29.9000	14.410	.343	.465	.160
Enhanced Overall Divisional Performance	27.8000	18.249	-.093	.408	.351
Cost of capital	29.3143	14.422	.296	.380	.175
Moving Average Price	29.1857	16.037	.231	.375	.228
Efficiency	27.7857	18.113	-.086	.407	.352
Inventory turnover	27.9857	18.768	-.150	.221	.372
Obsolescence	28.6429	12.581	.471	.359	.059
storage space	29.3857	17.429	-.062	.253	.359
Quotation price	29.1429	14.994	.238	.421	.207
Power tariffs	29.2429	17.259	.061	.238	.289
Reduced costs	27.9000	17.772	-.058	.313	.343

Reliability: internal consistency of Customer service

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.846	.854	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Customer complaints	20.2143	9.823	.651	.516	.817

Customer feed back mechanism	19.9714	10.782	.699	.598	.810
Customer positive feedback	20.2714	9.795	.681	.507	.810
Customer responsiveness score	20.1000	10.961	.679	.585	.814
Top management concern	20.0429	10.360	.543	.370	.841
customer service	19.9000	11.541	.574	.405	.831

Prediction of Quality of Customer Service

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.065	2.241		1.368	.176
	Quality of management practice	.289	.062	.507	4.687	.000
	Resource activation level	.301	.151	.205	1.996	.050
	Capability level	.274	.214	.124	1.277	.206

a. Dependent Variable: quality of customer service

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.696[a]	.484	.460	2.41230

a. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice

b. Dependent Variable: Quality of customer service

Correlations

		Quality of customer service	Quality of management practice	Resource activation level	Capability level
Pearson Correlation	Quality of customer service	1.000	.661	.492	.385
	Quality of management practice	.661	1.000	.502	.408
	Resource activation level	.492	.502	1.000	.265
	Capability level	.385	.408	.265	1.000
Sig. (1-tailed)	Quality of customer service	.	.000	.000	.000
	Quality of management practice	.000	.	.000	.000

N		.000	.000	.	.013
	Resource activation level	.000	.000	.	.013
	Capability level	.000	.000	.013	.
	Quality of customer service	70	70	70	70
	Quality of management practice	70	70	70	70
	Resource activation level	70	70	70	70
	Capability level	70	70	70	70

Quality of Customer Service

Histogram
Dependent Variable: quality of customer service

Mean = 1.27E-15
Std. Dev. = 0.978
N = 70
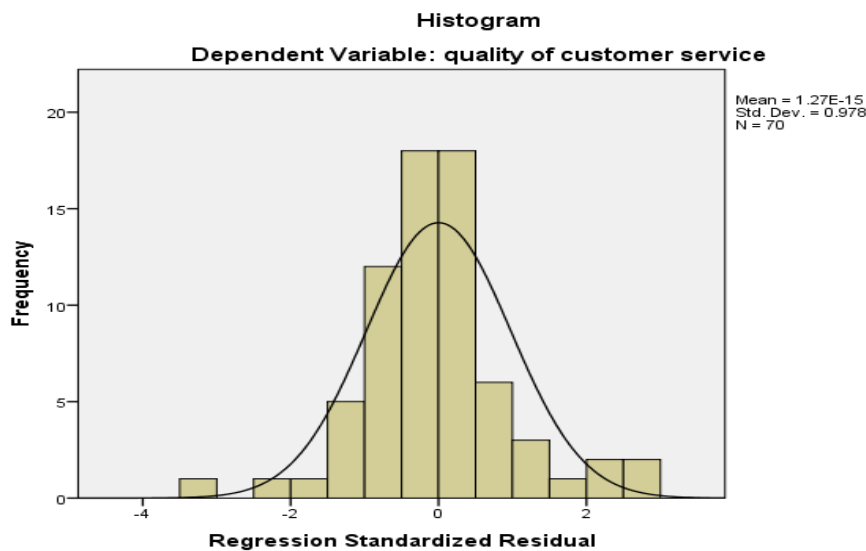
Prediction of Cost Reduction

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.234	4.008		7.792	.000
	Quality of management practice	.137	.110	.183	1.238	.220
	Resource activation level	-.392	.270	-.203	-1.452	.151
	Capability level	-.014	.384	-.005	-.035	.972

a. Dependent Variable: Reduced cost

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Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.193ª	.037	-.006	4.31470

a. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice

b. Dependent Variable: Reduced cost

Correlations

		Reduced cost	Quality of management practice	Resource activation level	Capability level
Pearson Correlation	Reduced cost	1.000	.079	-.113	.016
	Quality of management practice	.079	1.000	.502	.408
	Resource activation level	-.113	.502	1.000	.265
	Capability level	.016	.408	.265	1.000
Sig. (1-tailed)	Reduced cost	.	.258	.176	.448
	Quality of management practice	.258	.	.000	.000
	Resource activation level	.176	.000	.	.013
	Capability level	.448	.000	.013	.
N	Reduced cost	70	70	70	70
	Quality of management practice	70	70	70	70
	Resource activation level	70	70	70	70
	Capability level	70	70	70	70

Histogram
Dependent Variable: reduced cost

Mean = -3.76E-16
Std. Dev. = 0.978
N = 70
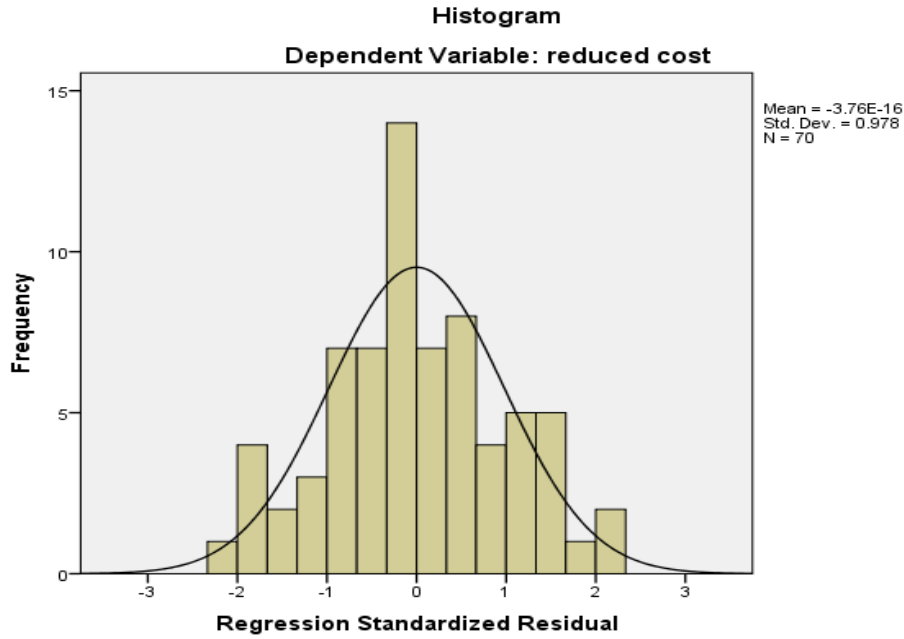
Prediction of cycle time reduction

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.907	4.287		-.678	.500
	Quality of management practice	.551	.118	.443	4.665	.000
	Resource activation level	1.087	.288	.339	3.768	.000
	Capability level	.933	.410	.194	2.274	.026

a. Dependent Variable: cycle time reduction

Model Summary

| Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.777[a]	.603	.585	4.61461

a. Predictors: (Constant), Capability level, Resource activation level, Quality of management practice

b. Dependent Variable: cycle time reduction

Correlations

		Cycle time reduction	Quality of management practice	Resource activation level	Capability level
Pearson Correlation	Cycle time reduction	1.000	.692	.612	.464

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	Quality of management practice	.692	1.000	.502	.408
	Resource activation level	.612	.502	1.000	.265
	Capability level	.464	.408	.265	1.000
	Cycle time reduction	.	.000	.000	.000
Sig. (1-tailed)	Quality of management practice	.000	.	.000	.000
	Resource activation level	.000	.000	.	.013
	Capability level	.000	.000	.013	.
	Cycle time reduction	70	70	70	70
N	Quality of management practice	70	70	70	70
	Resource activation level	70	70	70	70
	Capability level	70	70	70	70

Histogram

Dependent Variable: cycle time reduction

Mean = 2.71E-16
Std. Dev. = 0.978
N = 70
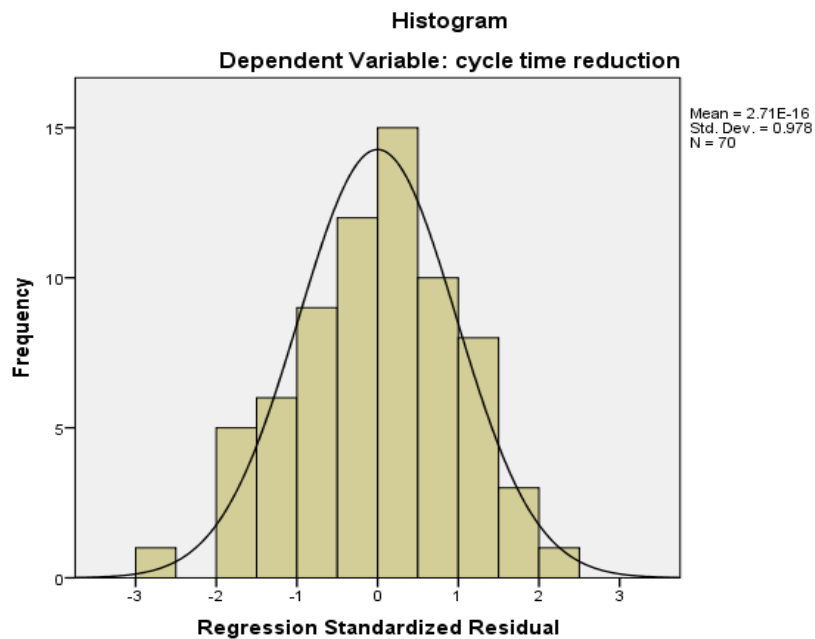
Prediction of overall performance

Correlations

		Overall performance	Quality of management practice	Resource activation level	Capability level
Pearson Correlation	Overall performance	1.000	.712	.478	.361
	Quality of management practice	.712	1.000	.502	.408
	Resource activation level	.478	.502	1.000	.265
	Capability level	.361	.408	.265	1.000
Sig. (1-tailed)	Overall performance	.	.000	.000	.001
	Quality of management practice	.000	.	.000	.000
	Resource activation level	.000	.000	.	.013
	Capability level	.001	.000	.013	.
N	overall performance	70	70	70	70
	Quality of management practice	70	70	70	70
	Resource activation level	70	70	70	70
	Capability level	70	70	70	70

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.729[a]	.531	.509	3.67485

a. Predictors: (Constant), internal dynamics, activity level, quality of management practice

b. Dependent Variable: overall performance

Histogram

Dependent Variable: overall performance

Mean = 7.91E-16
Std. Dev. = 0.978
N = 70
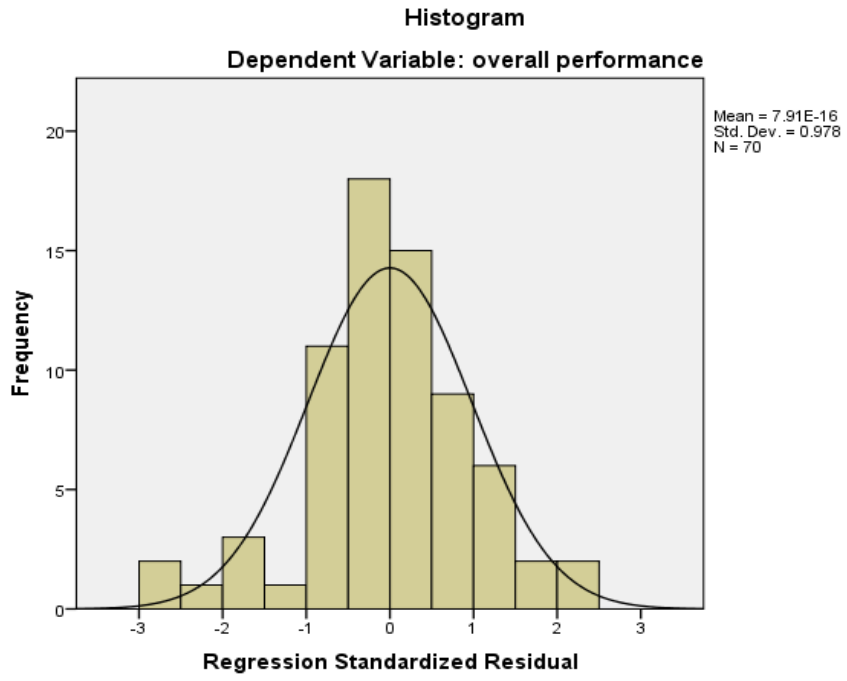
Appendix viii: Operationalization of Variables

Main Objective	Independent Variable	Secondary Variable	Indicator
Performance-Business Economic Benefits	Quality of Management Practices	Quality of Decision Making	Facilitated achievement of strategic milestones
			Customer feedback mechanism
			Business process reengineering
			ILS upgrading
			Performance targets with Subordinates
			Performance targets with Manager
			ILS training
			Team talk
			Has improved business practices
			Has improved decision making
		Quality of Internal operations	Observing PPOA requirements
			Manager sits in BOD
			Customer feedback mechanism
			Meet user demand
			Meet emergency needs
			Monitor customer turn-over
			Stand-by staff at night
	Resource Activation Level	Third party Contractors	Third party contractors
		Level of automation	On-line-real-time -processing
			Automated processes
	Capability Level	User awareness of ILS	Association of ILS to IS
			Association of ILS to organizational structure

Main Objective	Dependent Variable	Indicator
Performance - Business Economic Benefits	Customer Service	Customer complaints
		Customer positive feed-back
		Customer responsiveness score
		Top management concern for customer
		Improved customer service
	Cost Variation	Total stock holding
		Overall Divisional Performance
		Cost of working capital
		Moving average price
		Efficiency
		Inventory turnover
		Obsolescence

		Required storage space
		Quotation price for service lines
		Power tariffs
		Reduced costs
	Cycle Time Variation	Reduced lead time
		Reduced wait time
		Reduced service time
		Better utility of resources
		Stock-outs
		Increased stock turn-over
		Order filling
		Average time spent in warehouse
		Order processing time
		Cycle time reduction
	Overall Performance	ILS has improve overall firm performance
		Has enhanced economic benefits
		Has increased customer connectivity
		Has facilitated increase of return on investment
		Has increase gross margin
		Has increased profit margin
		Suited for managing inventory in the company
		Suited to propel the company to excellence

Appendix xi: Letter of permission

KCA UNIVERSITY
~ 1 9 8 9 ~

KCAU/ SGS.13/wm   Thursday, November 07, 2013

Your Ref ....

To whom it may concern,

Dear Sir/Madam,

RE: RESEARCH PROJECT

This is to certify that **JACKSON NJAU WAWERU REG NO. 12/00449** has been permitted by the School of Business and Public Management to carry out research on the topic **"IMPACT OF INTEGRATED LOGISTICS SYSTEM ON PERFORMANCE OF INVENTORY MANAGEMENT IN THE ELECTRICITY SUB-SECTOR IN KENYA".** The research is purely for academic purposes and for the partial fulfillment of the requirements for the MBA Corporate Management degree program.

Kindly assist the student with information where possible.

Yours faithfully,

Dr. Muchiri Mwangi
Dean, School of Graduate Studies & Research