

Integrated Financial Management Information System and Supply Chain Effectiveness

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Abstract

This study sought to determine the influence of Integrated Financial Management Information System (IFMIS) on Supply Chain Effectiveness focusing on Kirinyaga County Government Suppliers, staff who were IFMIS users and Kenya National Treasury IFMIS staff. This study was carried out in March 2017 and used a descriptive research design. The study used quantitative and then qualitative data to draw conclusions. Stratified sampling was used to arrive at a sample of 100 respondents. The causal-effect relationship was determined through use of regression test. The study found that IFMIS had a significant effect on Supply Chain Effectiveness. The effectiveness of the IFMIS could be improved by upgrading control system to protect documents from being attacked by viruses or getting lost, including stronger fraud detection, reporting and a wide application and use of e-purchasing in all county departments.

Keywords

Integrated Financial Management Information System, Supply Chain Effectiveness, E-Purchasing, Electronic Document and Recording Management System, Internal Controls

1. Introduction

Supply chain effectiveness is an important requirement for organisational success. With an increasingly turbulent and unpredictable business environment, there is a greater need for effectiveness in organizations to ensure survival and longer-term sustainability [1]. Organizations are continuously looking for ways and methods to ensure competitive advantage and value for money. This has led to the adoption of the Supply Chain (SC) concept which is gaining momentum

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in organizations from the tactical, reactive purchasing to strategic, proactive and relational Supply Chain Management (SCM). It is clear that it is not organizations competing but supply chains competing. There is a need for integration of management of activities between functions in organizations; suppliers of organizations and customers of organizations [2].

Public organizations have not been left in adopting modern concepts of management, it is noted that there is more public awareness and scrutiny of public institutions, there is need for greater value for money, therefore, requiring efficiency and effectiveness for their operations. The SCM approach has been adopted into government operations [2].

In a bid to improve effectiveness and streamline business processes in the government supply chain, most governments have implemented Integrated Financial Management Information Systems. IFMIS is an ICT tool used in the supply chain. It actually automates financial operations and improves efficiency. It is a radical method of reforming government processes and making them customer focused and effective. An IFMIS is an information system that tracks financial events and summarizes financial information [3]. It enables appropriate management reports, strategic, fiduciary responsibilities and the development of financial statements that can be audited. Basically, an IFMIS is an accounting system augmented to carry out a function depending on the requirements and the environment [4].

The size of the IFMIS will likewise shift contingent upon whether its operation is restricted to choose focal level foundations, for example, the finance ministry and treasury, or is actualized all the more comprehensively, to incorporate line services, their spending offices, and even local governments and regions [5]. The benefits arising from the implementation of IFMIS in the long term are far more than the capital cost [6]. Information from IFMIS can be used for various purposes like audit, budgeting among other uses [7].

The County Government of Kirinyaga is one of the 47 located in the central region of Kenya. Following the enactment of the 2010 Constitution, County Governments were conceived. The County Government of Kirinyaga succeeded the defunct County Council of Kirinyaga and all the municipalities within the county. Following the inception of County Governments and election of governors, they started building their capacity to offer the services as stipulated in the constitution to their residents. County governments partly draw their funds from the central government and the local revenue collection. To ensure transparency, accountability, fairness and efficiency in the counties, in 2014, the national government rolled out the IFMIS system into counties [8].

The IFMIS system has been implemented in County Governments since 2014. However, the e-procurement module that usually has a positive influence on sourcing and supply chain integration [2] hasn't been fully implemented since then. Due to the high levels of corruption in the procurement cycle cited in Kenya [9], the implementation of the e-procurement module should promote effectiveness, fairness, transparency, accountability in the supply chain. The

IFMIS system should further improve the Supply Chain integration through automation of processes; ensure compliance with legal & ethical practices, enhance information management and the audit trail and enhance internal controls [2]. IFMIS having consumed a huge amount of resources including staff and funds, the ongoing capacity building in human resource with the IFMIS academy and the unending support from the IFMIS staff, reports are still indicating high corruption levels, manipulation of systems, fraud and inefficiencies in counties [10].

1.1. Problem Statement

The emerging ICT solutions in organizations can improve performance in the supply chain [11]. As a result, the introduction of IFMIS has become a mainstream approach to improving Public Finance Management. Despite the huge amount of resources pumped into the system, IFMIS projects do not really provide the expected results in developing countries, as institutional, political, technical and operational challenges affect its successful implementation [5]. A number of researchers have looked into IFMIS. Hendriks (2012) conducted a research to identify the challenges and risks in the implementation of the IFMIS in South Africa, results indicated that there are many challenges involved in the implementation and then developed a set of best practice guidelines [3]. Lundu & Shale (2015) assessed the effect of IFMIS on staff competence and skills, organization policies, technological infrastructure and Top management support on SCM performance in Nairobi City County Government (NCCG) and indeed results confirmed that IFMIS has an effect on SC Performance. Few studies have looked at how IFMIS has influenced SCE. Especially looking at the Supply Chain in terms of internal controls, integration and accuracy, and reliability of information and records. Further, there is a need to look into IFMIS implementation given the COG's sentiments [12].

1.2. Hypothesis

The general hypothesis of the study was to determine the influence of integrated financial management system on supply chain effectiveness in Kirinyaga County Government.

Hence the study sought to test the following hypothesis:

H01: The Integrated Financial Management Information System does not have a significant Influence on Supply Chain Effectiveness.

H01a: Electronic Document and Records Management System has no significant influence on Supply Chain Effectiveness.

H01b: Internal Controls have no significant Influence on Supply Chain Effectiveness.

H01c: E-Purchasing has no significant Influence on Supply Chain Effectiveness.

1.3. Organization of the Study

This study is organized into five broad sections. The first section is introduction

which provides a background of the study, problem statement and objectives of the study. A second section is on the literature review which has presented a review of studies done on the e-procurement, the opinions of scholars and findings of other scholars as well as theoretical concepts. The third part is on the research methodology which outlines how data was collected and analyzed while the last two parts are on the results and conclusions of the study.

2. Literature Review

2.1. Electronic Document and Record Management System and Supply Chain Effectiveness

Information starts life as data which is raw unrelated facts that have little value on their own. Information is processed, combined and contextualized data [13]. Researchers view information quality from the following different dimensions, first consider the following characteristics: content, recency, frequency and accuracy [14]; Second measure information in terms of accuracy, credibility, frequency and availability of forecast [15]; Third measure information quality by accuracy, currency, and completeness [16]; Fourth measure information intensity and quality [17].

Information quality is an important determinant of the usefulness of an information system. Sum, Yang, Ang and Quek (1995) researched on data accuracy and found out that it affects customer service and efficiency [18]. McGowan (1998) argued that information systems are actually useful when the information is readily accessible, high quality, relevant and accurate. IFMIS is an information system that is management oriented. Its success depends on ensuring that information quality is high and reliable. It is also important to note that SCE depends on information quality [19].

An information system is a set of interrelated complementary components that collect, process, store and disseminate information to support decision-making, coordination, control, analysis and visualization in an organization [20]. Information Systems shape the reason for directing business nowadays. In numerous organizations, it turns out to be practically difficult to contend at a national and at a worldwide level without the utilization of data frameworks. Effective business requires data frameworks for monitoring bona fide proof of business movement. This confirmation of business exchanges is principally contained in both physical and electronic records [21].

There are two disciplines that contribute to the problems, issues, and solutions in the study of information systems which include; technical and behavioural disciplines [20]. Previously, organizations mostly applied the technological approach but the behavioural approach is also gaining ground [21]. This study will dwell on the technical part of the information system looking at IFMIS as a system and how it has influenced the supply chain. Laudon and Laudon (2006) view information systems from the following dimensions: organizations; management and; technology [20].

In the organisation dimension, information systems are a piece of associations. Data frameworks will have embedded inside them the way of life, individuals, structure, business processes and legislative issues of an association. In Management, Information Systems supply apparatuses and data required by managers to distribute, facilitate and screen their work, decide, make new products and settle on long-run key choices. Technology: Management utilizes Information System Technology (equipment, programming, stockpiling and broadcast communications) to do their capacities [20].

It is important to talk about the different types of Information Systems when looking at IFMIS. Laudon and Laudon (2006) outline four types of information systems: executive support systems (ESS) at a strategic level; management information systems (MIS); decision-support systems (DSS) at management level, and transaction processing systems (TPS) at the operational level. In this case, we are interested in Management Information Systems (MIS) which provide managers with the reports and online access to the organization's performance and historical records [20]. MIS are oriented exclusively to internal, not environmental or external events. MIS provide information to support tasks, management and decision-making functions in an organization [22]. There are different information systems but this study will look at Management Information Systems and more specifically Integrated Financial Management Information System.

It is important to differentiate between a record and a document. A document is recorded information, an object which can be treated as a unit and a record of information created, received, and maintained as evidence and information by an organization or person, in pursuance of a legal obligation or a business transaction. Documents provide evidence of business transactions and can exist in any format [23]. A record is recorded information independent of form or medium and which serves as evidence of a transaction, preserved for the evidential information it contains [21]. A document is a living piece of communication that can be changed or revised. A record, on the other hand, gives evidence of what has already occurred, cannot be revised or altered and should be controlled throughout its life cycle [21].

A document, whether in electronic form or paper, is a basic communication device in what is considered an unstructured form (as opposed to structured data records), which in some cases can be embedded within different electronic documents that are used in most organizations. A record has evidential value as it gives evidence to an organization's functions, policies, decisions, procedures, operations or other activities of a government agency or corporation [24]. Documents are created in conjunction with the daily tasks of the organization to record and convey information. They may have transitory, collaborative, or referential value to the organization. Records are created and retained to meet operational and legal requirements by accurately recording a business event [25].

There is a need to differentiate records management and documents man-

agement. Records Management is the process of ensuring the proper creation, maintenance, use and disposal of records to achieve efficient, transparent and accountable governance [21]. Document management is about managing a single item, the first part of the life cycle, while records management manages the entire life cycle. Records management involves managing document retention and preservation and reducing the risk of lost content. It goes on to state that a good records management system include people, processes, and technology [26].

Electronic Document Management System and Electronic Records Management System are types of computer systems that are used for the management of information. EDMS is the management of electronic documents contained in an information technology system, which uses hardware and software to manage, control, locate and retrieve information in the electronic system [21]. EDMS and ERMS are types of computer systems that are used for the management of information [27]. EDMS is a computerized system that supports the creation, capture, organization, storage, retrieval, manipulation and controlled circulation of documents in electronic format. The ERMS definition also supports the life cycle view by stressing that ERMS are designed to manage the maintenance and disposition of records [28].

ERMS is an electronic system for managing records on any media. An electronic system for managing paper records in a record centre or registry would be an ERMS [28]. The driving factor towards the implementation of document management systems is the sharing of knowledge and collaboration capabilities that can be enhanced by having a document repository in place. On the other hand, a records management system is more focused on maintaining a repository of evidence that can be used to document events related to statutory, regulatory, fiscal, operational or historic activities within an organization [27]. It is clear that ERMS are designed to automate records management controls while EDMS lack the capabilities for records control [21].

EDRMS has the electronic capability that helps in the management of both electronic and physical records. In the case of physical records, it records their location and other information about them [27]. ERMS prevents records modification, controls record deletion, include an arrangement structure which is maintained by the administrator, may support day-to-day working, but is also intended to provide a secure database for meaningful business records. Some of its key features are a declaration, classification, access control, disposition, and long-term preservation [21]. The decision to implement EDRMS results from the need to ensure that documents in an EDMS that qualify as records will be designated as such and specially treated and given protection they require [28].

The EDMS involves a software system for managing documents and a database for managing the metadata of documents. It also includes other technologies such as document imaging, document retrieval, reporting, character recognition, document management, workflow, form processing, content manage-

ment, digital signature management, and storing and archiving technologies [29]. Additionally, the need for EDRMS is being fueled by a number of key business drivers. The following sub-section will discuss significant drivers for acquiring EDRMS [27]. Recent literature has used the term ECM to refer to the same technologies for managing documents and records, hence the researcher will in some cases use EDRMS and ECM as interchangeable, depending on the source used [21].

Business drivers from EDRMS just like other electronic systems include compliance; effectiveness; efficiency, and; continuity. Compliance is to laws, regulations, policies, standards and good practice [4]. Most organizations are forced more than ever to show an ability to be compliant and demonstrate that compliance. The organization may need to prove that it has taken certain decisions or has complied with records management requirements [21].

Effectiveness derives from a need to do things better in a way that is sensible for the business or organization. Examples of the improved effectiveness that EDRMS usually brings to the organization include; not losing records, sharing records, finding records easily and getting a complete picture of what is going on in an organization for audit and archival purposes which are core requirements for improved Supply Chain Performance. Efficiency is closely related to cost savings. Cost is always a factor, with the current global recession and companies, big and small, are constantly looking at ways of cutting cost and at the same time maximizing output. Effectiveness is rated as a bigger driver than efficiency as it provides more benefits. Companies are becoming aware of the cost of keeping or managing information. Continuity means being able to maintain and recover information in the event of a breakdown or disaster.

2.2. Internal Controls and Supply Chain Effectiveness

Internal controls can be defined as the mechanism used by organizational leaders to convey strategy, vision, and desires to the rest of the organization. They exist in the form of standards, policies, procedures and rules. Proper internal controls ensure effective risk management [30]. Internal control system represents all the approved policies and procedures used by the management in order to achieve and effective management of business. The control system includes internal control and internal procedures [31]. Warranty provided by the auditors is to reduce the risk of distortion. Auditors should establish confidence in the market and maximize shareholder's wealth [32].

Lack of internal controls and their deficient operation make companies vulnerable to a number of risks, such as improper recording of accounting transactions, making unauthorized transactions, fraud, all these having a significant impact on financial performance and competitiveness [33]. Internal controls are also defined as measures for the detection and prevention of fraud risk. In Procurement and Supply Chain management specifically, internal controls are important because they are the functions responsible for developing and managing

of commercial contracts relationships [31].

Individuals in the procurement functions are exposed to fraud risk because They Operate in a stewardship role, responsible for custodianship of finance and assets which are owned by shareholders of the business; potentially control very large sums of organizational funds; are faced by many opportunities to commit financial fraud or to misuse systems, power or information for personal gain; Are in a position of trust within a business; Are responsible for the standing, credibility need reputation of the organisation in its dealings with supply chain partners and other stakeholders [34]. Below are supportive mechanisms(internal controls) for good governance: Robust internal policies, checks and control mechanisms; effective budgeting, control and monitoring of procurement spend; clearly defined roles, responsibilities, accountabilities and reporting structures for procurement; controls over the authority levels of individual buyers; clear requirements for approvals and authorizations; clear audit trails; segregation or division of procurement duties; use of e-procurement tools to minimize cash transactions; minimize potential fraudulent intervention in procedures; internal audit of procurement processes, decisions and controls, [33]. This actually indicates that IFMIS has greatly applied internal controls to ensure good governance.

Internal controls are defined as a process because an internal control system is not an end in itself but a means to an end. Internal control is a “process, effected by an entity’s board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories: Effectiveness and efficiency of operations, Reliability of financial reporting, Compliance with applicable laws and regulations” [35]. The Basel committee on banking supervision defined internal controls as a “process effected by the board of directors, senior management and all levels of personnel. It is not solely a procedure or policy that is performed at a certain point in time, but rather it is continually operating at all levels within the bank” [36].

Internal controls can also be perceived as a system. A system is a set of inter-related and interdependent components that interact in a way to achieve a set goal. These components or sub-systems are interdependent and the failure of one component leads to the failure of the whole system [32]. An organization which is divided into various sub-systems and thus needs a system of controls over units, divisions and departments, for its effectiveness and survival. An effective internal control system is an integrated system with interrelated components, supporting principles and attributes [31]. There are three major components of internal controls; control environment, accounting system and control procedures [37].

An internal control system available to firm consists of management oversight and the control culture; risk recognition and assessment; control of activities and segregation of duties; information and communication and monitoring activities and correcting deficiencies [38]. Internal Control Integrated Framework by

Committee of Sponsoring Organisations (1992) classifies organisations' internal control system into five integrated components which should be embedded into business processes across organisation, in its efforts to achieve objectives [39]. The components are; control environment; risk assessment; control activities; information and communication and; monitoring activities [40].

The internal control system is an integrated system, with management processes to attain organizational goals. For an organization to achieve its organizational objectives, the five control components of the control environment, risk assessment, information and communication and monitoring must be integrated into management processes through the entire organization [31]. Like the body system, the internal control components and business processes must interact seamlessly for effective internal control [40]. Control objectives and measures that are derived from the monitoring and assessment of risks should be integrated into business units and business practices, through an effective information and communication control component that ensures effective flow of information to individuals in charge of internal controls in the entity [41].

The effectiveness of an internal control system depends on how flexibly and seamlessly the system interacts with itself and how embedded it is in the organization's business processes. Again for an internal control system to be effective and provide that needed assurance to the top management, there should be some "agents of effectiveness". Therefore there is need for management and the board to evaluate and assess the effectiveness of the internal control system periodically [31]. An internal control system can be said to be effective if the top management believes that the system facilitates the achievement of organisational objectives [39]. An internal control framework emphasizes on explanations and details of the components of the system and methods for their design but assumes details on how each to measure the components to assess their effectiveness is a deficient control system [40].

Assessing the effectiveness of internal controls should consider the components of internal control. Judging effectiveness of an internal control system of an organization is subjective, this results from the assessment of the working of the five components of internal control system in the organization [35]. IFMIS has specifically embedded internal controls including segregation of duties, levels of authority and approval, the flow of information, access controls including passwords and user names which with the intent of curbing fraud and increasing efficiency and effectiveness in the supply chain [3].

2.3. E-Purchasing and Supply Chain Effectiveness

E-Sourcing and e-Procurement are major components of the purchasing cycle. E-Procurement is "using the internet to operate the transactional aspects of requisitioning, authorizing, ordering, receipting and payment processes for the required services or products." [34]. Typically, e-Procurement is the focus of local business administrators and/or empowered users which ensures decentrali-

zation of the procurement cycle, ranging from requisition, authorization, order, receipt and payment. E-Procurement is mostly associated with to the transactional/compliance level of purchasing [42].

Public sector agencies globally have prioritised procurement (e-Procurement) while implementing e-Government. Electronic procurement is business-to-business purchasing practice that utilizes electronic commerce to identify potential sources of supply, to obtain organisational needs, to pay, and to interact with suppliers [43]. E-procurement manages supply chains in the procurement of goods and majorly uses internet information systems and electronic markets. An organisational procurement function is categorized into strategic and operational procedures because the activities involved are different [44].

E-procurement can be used together with various technologies of electronic commerce like as document imaging, workflow management and e-mail to support business process re-engineering. E-Procurement is strategic and therefore benefits an organization in achieving strategic goals [34]. E-procurement consolidates orders leading to discount and economies of scale. It enhances efficient flow of information between buyers and suppliers, which reduces administration costs and time, allowing procurement professionals time to focus on more strategic greater value adding activities [45]. Governments globally have placed importance on e-procurement systems to ensure efficiency, accountability and greater transparency [46]. However, there is limited evaluation of e-procurement undertakings by scholars [47]. Many researchers agree that the intensely competitive nature of the business environment makes the effective use of e-procurement an operational necessity for firms; e-procurement is an initiative that must be given strategic consideration in the short-term and the long-term to increase chances of achieving organisational objectives.

E-procurement ensures some benefits including integration between buyer and suppliers, reduced staff time required, enhanced coordination, reduced costs of transactions, shorter procurement cycles, lower inventory levels, and greater transparency. E-procurement is considered an electronic integration and management procurement activities, including purchase request, authorization, ordering, delivery and payment between a purchaser and a supplier [48]. Croom (2000) argues that e-procurement systems, are a reflection of the procurement process by providing two different, but connected, infrastructures internal processing and external communication with suppliers [49]. According to Tatsis *et al.*, (2006) e-procurement integration, management, automation, optimization and enablement of an organization's procurement process, using electronic tools and technologies and web-based applications [50].

Sourcing is the determination of how and where to obtain goods and services in order to fulfill an organizational need [34]. Organizations have always practiced some level of Sourcing. At its most basic, it is the process of analyzing the spend of the organization, understanding the opportunities to reduce spend, based on an understanding of the external environment comparing with internal

needs develop a strategy to manage the organisational spend, conduct Request For Information, Request For Quotation and Request For Proposals, negotiate contracts, manage contracts and monitor supplier performance [42].

Sourcing is complex and was previously a manual process. The following are activities in sourcing: Prioritise organisation requirements for goods and services sourced [34]; obtain information on the supply market; identify and select suppliers that will meet organisational needs; add value through negotiation with suppliers; supplier relationship management and integration; innovate value adding and cost-reducing ideas [2]; continuously monitor the market for better supplier opportunities and more effective sourcing methods; develop strategic business relationships; manage performance against agreed indicators; ensuring achievement of strategic goals, cost saving programmes and efficiencies [42].

With the current trend of applying ICT in organizational processes, most operations have been automated. This brings us to the electronic processes. The perception of what e-Sourcing is has strongly evolved over the last years. E-Sourcing is “the Sourcing process enabled with the appropriate web-enabled, collaborative technology to facilitate the full life-cycle of the procurement process for both buyers and suppliers.” [42]. E-sourcing is a strategic activity carried out by the procurement professionals to develop and manage contracts to ensure compliance. These contracts are made available by the Purchase 2 Pay (P2P) process. E-sourcing involves the buying process, with full discretion to a specialist buyer, which includes Knowledge (for example spend analysis, specification), Request for Quotation/e-Tender/e-Auction and contract evaluation/negotiation, tracking, forecasting and monitoring savings [34]. E-sourcing is the process of identifying next supplies for a specific spend category, using internet technology usually the internet itself [51].

E-sourcing whether through an electronic, online auction is one of the most efficient and economical way of accessing suppliers leading improved supply chain performance. Finally, e-sourcing frees up purchasing personnel to focus on more strategic activities like supply base development, facilitating suppliers into innovation processes. E-sourcing solutions add value by reducing spend costs, optimizing processes and supporting innovation.

The benefits of supporting the sourcing process with the necessary tools can be categorised into four: Analysis (spend, process, performance); Process and knowledge management; Collaboration and negotiation; Compliance [34]. The end result is that e-Sourcing allows the purchasing department to act more effectively and increase its credibility and its footprint in the organization.

3. Research Methodology

This study adopted a descriptive research. The purpose of descriptive research is to observe, describe and document aspects of a situation as it naturally occurs. The study mainly focused on the 1500 employees including those from supply chain management, user departments, finance and accounts, 500 suppliers who

were working with Kirinyaga County Government in 2016 and 50 National Treasury IFMIS staff. A County Government in Kenya is a fully fledged organization with two arms of government including Legislature and Executive. It provides services in several industries like health, Infrastructure, agriculture, trade, mining, transport, fire-fighting, law enforcement and tourism. This provides a good representative population for a society. The Finance and Supply Chain departments are the major users of the IFMIS. Others user departments primarily use the IFMIS for budgeting, procurement requisitions and reporting. IFMIS staff located in the National headquarters are the back-end and support for the IFMIS. They primarily focus on technical areas. The suppliers use IFMIS to access procurement opportunities and monitor their payments. This explains the distribution of the target population samples. The Supply Chain department has more knowledge and experience in regard to use and interaction with the system. Thus the use of the sample was a good representation of the entire population of interest (**Table 1**).

The data was collected through in Kirinyaga County Government and the IFMIS headquarter in Nairobi, Kenya through questionnaires. Univariate analyses were done using Linear Regression models that fit to assess the influence of each of factors on supply chain effectiveness. The coefficients and their confidence interval were reported as well as P-values. In this study, the results and conclusions are presented using graphs, charts, and tables for easy reading. The regression model was presented as follows:

$$Z = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \varepsilon$$

b_0 is the regression intercept; Z is the dependent variable (supply chain effectiveness); X_1 is Electronic data records management; X_2 is internal control systems; X_3 is E-Purchasing; b_1 to b_3 are the regression coefficients; ε is the error term.

The b_0 represents the coefficient or the value of Z when the rest of the factors were not taken into consideration. The regression coefficients shows the actual effect of the independent variables on the dependent variables while the error term values showed the contribution of other factors which were not part of the model.

Table 1. Sampling size.

Category	Population	Sample size	Percentage
Supply Chain management	60	30	30
User departments	1290	20	20
Finance and accounts	150	10	10
Selected suppliers	500	30	30
IFMIS staff	50	10	10
Total	2050	100	100

The study used Ordinary least squares (OLS) regression to test the effect of the independent variable on the dependent variable. However, OLS is sensitive to outliers or influential observations which can give inefficient estimation. Inefficient estimator has a large variation from sample to sample. This means that the estimator tends to be too sensitive to the particularities of the given sample. To overcome this challenge, the study used robust regression as method in STATA as an alternative to OLS regression which is less sensitive to outliers and still defines a linear relationship between the outcome and the predictors.

4. Results and Interpretation

The study had a response rate of 85%. This is considered excellent [52].

4.1. Influence of Electronic Document and Record Management System in IFMIS on Supply Chain Effectiveness

The first hypothesis of the study focused on determining the influence of EDRMS on the effectiveness of the supply chain in Kirinyaga County. This section therefore, provides findings on the influence of Electronic Document and Record Management Systems (EDRMS) on the effectiveness of the supply chain in the county government of Kirinyaga.

4.1.1. Descriptive Statistics of Electronic Document and Record Management System

The descriptive test undertaken is shown in **Table 2**.

Table 2 displays the results on the use and application of the EDRMS in the County Government of Kirinyaga.

The study shows that most (mean = 3.7 out of 5) of the respondents store their documents in electronic formats. There was relatively wide dispersion (SD = 1.2) as to whether they stored documents electronically or not. Most of the respondents (mean = 4.0 out of 5) agreed that use of electronic platform for the documents provided easy access of information in the systems.

Table 2. Descriptive statistics—EDRMS.

EDRMS	N	Mean	SD
We store documents electronically	83	3.7	1.2
Easy access of information in the system	85	4.0	1.0
Stored information in IFMIS cannot be corrupted	84	3.5	1.2
Stored information in IFMIS cannot be lost	85	3.5	1.2
Can generate reports from the system	85	4.1	0.9
Only authorized individuals can modify documents	83	4.1	1.0
Records cannot be lost from IFMS	85	3.8	1.1
Information can easily be retrieved from the system	85	4.2	0.8
Stored document can easily be tracked	84	4.3	0.7
System provides an audit trail	82	4.2	0.8

When asked whether the stored information in the IFMIS could be corrupted, the value of the Standard Deviation (SD = 1.2) was 1.2 showing that some of the respondents felt that such files could be corrupted. Further, respondents showed wide dispersion of opinions as to whether information stored with IFMIS could not be lost. This in turn showed lack of consensus implying that some of the respondents believed that information stored in IFMIS could get lost as well.

The mean was 4.1 implying that on average the respondents agreed they could generate reports from the system. The mean value of the statement was 4.1 indicating that respondents generally agreed that only few and authorized individuals could modify documents in the system. SD of 0.9 showed that respondents had relative consensus compared to other aspects. This further, implied that the system had some degree of controls and security.

When asked whether records could get lost from the system, the mean value was 3.8 implying that the respondents generally held a similar opinion. However, the value of the Standard Deviation 1.2 showing lack of consensus on the results. Thus there were some respondents who held a different opinion that records could get lost in the system. This shows that while most of the people believed it was leak proof, there were a significant number of others who believed it was not.

The use of the system was associated with other positive aspects. For example, the results show that majority of the respondents agreed that information could easily be retrieved from the system. The value of the mean was 4.2 while the value of standard Deviation (SD = 0.8) suggesting that there was a general consensus that the system provided easy retrieval of information. In addition, majority of the respondents agreed that the system could easily be used to track stored documents. This was confirmed by the mean value of 4.3 and a Standard Deviation of 0.7. The results implied that the responses were densely spread indicating that the findings were agreed upon by most of the people. Lastly, most agreed that the system left audit trail with a mean of 4.2 and an SD of 0.8 the respondents affirmed with a relatively high degree of consensus that it left an audit trail.

When asked on how EDRMS had impacted on effectiveness of supply chain, most of the respondents cited that it saved on time, enhanced retrieval of information, enhanced information security, improved transparency and accountability and easy access to information among others.

4.1.2. Regression Test on Electronic Document and Record Management System and Supply Chain Effectiveness

This section presents the results of a regression test done to establish the effect of EDRMS on effectiveness of the supply chain in Kirinyaga County (**Table 3**). The test was done at 95% confidence level with an Alpha value (α) of 0.05.

The simple linear regression equation was given as:

$$Z = 1.521632 + 0.5383388X_1$$

where: 1.52 represented the regression intercept; Z was the dependent variable

Table 3. Coefficients—effect of ED RMS on supply chain.

Robust regression		Number of obs = 80				
		F(1, 78) = 20.12				
		Prob > F = 0.0000				
Supply_cha~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ED RMS	.5383388	.1200212	4.49	0.000	.299395	.7772827
_cons	1.521632	.4791753	3.18	0.002	.5676674	2.475597

(supply chain effectiveness); X1 was Electronic Data Records Management; 0.54 was the regression coefficients.

The results show that introduction of the ED RM system by 1 unit holding other factors constant would increase the effectiveness of the supply chain by 0.54 units. This shows that adopting the use of ED RM system increased the effectiveness of the supply chain activities in Kirinyaga County.

4.2. Influence of Internal Controls in IFMIS on the Effectiveness of Supply Chain

The second hypothesis of the study focused on the influence of internal controls on the effectiveness of the supply chain. Thus this section presents tests on the internal controls and how those internal controls influence the effectiveness of the effectiveness of the supply chain activities.

4.2.1. Descriptive Statistics of Internal Controls

This section discusses the descriptive statistics which were tested on the data collected on internal controls in the IFMIS system. The data was collected on a five-point likert scale and analysed using frequencies, mean and standard deviation. The results are shown in **Table 4**.

Table 4 shows the results on descriptive tests done on data collected on internal controls.

From the results, most of the respondents strongly agreed that they used a password to access IFMIS. The mean was 4.7 indicating that generally the respondents strongly agreed. Thus, one of the controls which IFMIS had were passwords to access the system meaning that only the recognized and authorized persons could access and use the system. Majority of the respondents also strongly agreed that different roles were carried out by different people in IFMIS. The values of the mean (Mean = 4.4) and standard deviation (SD = 0.8) indicated that a general consensus that respondents agreed with the statement. The results were further affirmed by the fact that IFMIS had segregated the duties to different persons as indicated by most of the respondents (Mean = 4.3). Further an SD of 0.7 showed a relatively high degree of consensus. It can thus be

Table 4. Descriptive statistics-internal controls in ifmis.

	N	Mean	SD
Use of passwords to access IFMIS	85	4.7	0.5
IFMIS has allocated roles to individuals to carry out different tasks	84	4.4	0.8
IFMIS has segregated duties to different individuals	83	4.3	0.7
Can only carry out the number of tasks IFMIS has allocated to me	85	4.1	1.0
Internal controls in IFMIS monitor the procurement process	83	4.1	0.9
Internal controls in IFMIS can detect fraud	82	3.6	1.1
Internal controls in IFMIS can report fraud	84	3.5	1.0
Internal controls in IFMIS promote accountability	85	4.2	1.0

deduced that, IFMIS had split the roles and duties as an internal control so that no single individual could carry out all the activities in IFMIS system.

Another control established was that the system only allowed a person to do the number of tasks allocated to him or her as indicated by majority of the respondents (Mean = 4.1). Majority of the respondents agreed that the system could monitor procurement processes. The mean was 4.1 and the standard deviation was 0.9 showing that the statement was generally agreed to by the respondents.

The study noted a relatively most of the respondents could not tell whether the system could detect fraud. However, the mean value was 3.6 indicating that the central position of the respondents was that it could detect fraud. The values of standard deviation 1.1 implying that a significant number respondents felt otherwise. Similarly, a significant number of the respondents could not indicate whether internal controls in IFMIS could report fraud but majority agreed it could report fraud. This was confirmed by the corresponding mean value was 3.5 while the standard deviation was 1.0. This shows that on average, the respondents felt that the system could report fraud related cases although some respondents felt otherwise. Lastly, the controls in IFMIS were perceived by majority as promoting accountability in supply chain activities. The mean was 4.2 and standard deviation was 1.0 indicating some slight differences on opinion by the respondents. These results prompted the supposition that the use of the IFMIS internal controls promoted accountability in supply chain activities.

Further, the respondents also indicated other effects and benefits on how internal control had influenced the effectiveness of the supply chain. These include enhancing accountability and transparency, ease in monitoring and regulation of the process, improving information security (no unauthorized access), made the processes faster (less time consuming) and general improvement in service delivery.

4.2.2. Regression Test on the Internal Control and Effectiveness of the Supply Chain

This section provides the results from the simple regression on the effect of the

internal controls. The test was done at 5% level of significance and the probability value of 0.05 was used to determine statistical significance. The findings are shown in the following tables and interpretations.

Table 5 shows coefficients of the regression test. The resulting regression equation was given as:

$$Z = 0.6568265 + 0.7252798.X2$$

where: 0.6568265 represented the regression intercept; Z was the dependent variable (supply chain effectiveness); $X2$ was internal controls and 0.7252798 was the coefficient of internal control.

The results imply that a unit increase in internal controls holding other factors, increased the effectiveness of the supply chain by 0.7252798. This shows that internal controls in IFMIS affected the effectiveness of the supply chain positively.

4.3. Influence of E-Purchasing in IFMIS on Supply Chain Effectiveness

The third hypothesis of the study was on the influence of the e-purchasing on the effectiveness of the supply chain. This section covers the findings on hypothesis three of the study on the e-purchasing and its influence on the effectiveness of supply chain. The results are shown and discussed in the following tables and sub-sections.

4.3.1. Descriptive Statistics on E-Purchasing

This section discusses the descriptive statistics which were tested on the data collected on e-purchasing in the IFMIS system. Similar to section 4.4.1, the data was collected on a five-point likert scale and analysed using frequencies, mean and standard deviation.

Table 6 shows that most of the respondents agreed that IFMIS enabled county staff to search for new suppliers. The corresponding value of mean was 3.5 and the standard deviation was 1.2. This shows that the central position of the respondents on the statement was that it allowed search of new suppliers but some held different opinions. A mean of 3.2 showed that some of the respondents could not indicate whether the system allowed them to interact with new suppliers or not. The value of Standard deviation was 1.3 showing some significant differences in the respondent's opinions. When asked whether they could evaluate the capabilities of suppliers through the system, most of the respondents agreed that they could evaluate. However, the mean value was 3.1 indicating that respondents could not tell whether they could evaluate suppliers. The standard deviation was 1.2 implying mixed perceptions about that aspect in IFMIS.

With a Mean of 3.3 a significant proportion of the respondents indicated that the system facilitated electronic search of supplier location although a significantly large percentage had doubt about that. The standard deviation of 1.2 shows that there was lack of consensus among the respondents on that aspect of the system. On the ability to float tenders electronically, majority agreed that the

Table 5. Coefficients—effect of internal controls on the effectiveness of supply chain.

Supply_chain_ef-s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Internal_controls	.7252798	.1136359	6.38	0.000	.4990932	.9514663
_cons	.6568265	.4734036	1.39	0.169	-.2854598	1.599113

Robust regression

Number of obs = 81
F(1, 79) = 40.74
Prob > F = 0.0000

Table 6. Descriptive statistics—e-purchasing.

	N	Mean	SD
Electronically search for new suppliers electronically	64	3.5	1.2
Electronically interact with new suppliers	84	3.2	1.3
Electronically evaluate new supplier capabilities	84	3.1	1.2
Electronically search for supplier location	83	3.3	1.2
Electronically float tenders	81	3.5	1.1
Electronically order for goods and services	84	3.1	1.3
Procurement approvals are done electronically	82	4.0	1.2
Supplier invoices are sent electronically	83	3.1	1.3
Electronically process payment to our suppliers	82	4.3	0.9

system enabled them to float tenders electronically. This was based on 3.5 mean. However, the value of the standard deviation was 1.1 showing that some stated they could not float tenders electronically.

A significant percentage of the respondents indicated that the system allowed them to electronically order for goods and services. The average value was 3.1 and the standard deviation was 1.3. This shows that the central position of the respondents on the issue was that it allowed them to order for goods and services online. However, the Standard deviation shows that a relatively large percentage of the respondents (SD = 1.3) held other views on the same. In connection to that, majority of the respondents agreed that procurement approvals could be made electronically. This was supported by a mean of 4.0 although the value of standard deviation was 1.2 implying that the average or central position of the respondents was not a consensus and that other respondents felt the system could not allow approvals to be done electronically.

In terms of financial documents, majority of the respondents indicated that IFMIS allowed supplier invoices to be sent electronically. The mean was 3.1 and the standard deviation was 1.3 indicating that variability of the responses was significantly large. Thus the central position of the respondents on this aspect was unclear as some agreed and others did not. The system could however,

process payments to the suppliers as indicated by majority of the respondents. On average, the respondents agreed (Mean = 4.3) that they could process payments to suppliers electronically.

Further the respondents cited other effects of E-Purchasing on supply chain. The most common ones included saving time and resources, increasing accountability and transparency of the processes, improved supplier competition, ease of procurement processes, reduced workload and better record keeping among others.

4.3.2. Regression Test on E-Purchasing and Effectiveness of the Supply Chain

This section provides the results from the simple regression on the effect of the e-purchasing on the effectiveness of the supply chain in the county government of Kirinyaga. The test was done at 5% level of significance and the probability value of 0.05 was used to determine statistical significance (**Table 7**).

The resulting simple linear regression equation was given as:

$$Z = 2.332697 + 0.389334X_3$$

where: 2.33 represented the regression intercept; Z was the dependent variable (supply chain effectiveness); X_3 was e-purchasing and 0.39 was the coefficient of e-purchasing.

The result shows that a unit improvement in the e-purchasing holding other factors constant increased the effectiveness of the supply chain activities by 0.39 in Kirinyaga County. This shows that e-purchasing has a linear effect on the effectiveness of the supply chain in then Kirinyaga County.

4.4. Overall Effect of IFMIS System on the Effectiveness of Supply Chain

This section discusses the effectiveness of supply chain activities in the County government of Kirinyaga. The section has descriptive statistics, correlation and regression tests.

4.4.1. Descriptive Statistics

This section provides the descriptive statistics on the extent of effectiveness of the supply chain activities in Kirinyaga County.

Table 8 shows that the extent of effectiveness of supply chain operations in Kirinyaga County. As per the results, most of the respondents indicated that supply chain was integrated in the County. The median was 4 and the interquartile range was 1 implying that in general the likeliest response was that integration was done to a great extent. The competitiveness of the suppliers was rated to a great extent by majority of the respondents implying that there was quite a rivalry among the suppliers probably due to the effectiveness of the supply chain processes.

Out of the respondents who participated in the study, most of them indicated that supply chain processes were transparent to a great extent. A relatively large

Table 7. Coefficients—effect of e-purchasing on the effectiveness of supply chain.

Robust regression		Number of obs = 81				
		F(1, 79) = 31.54				
		Prob > F = 0.0000				
Supply_cha~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
E_purchasing	.389334	.0693277	5.62	0.000	.2513406	.5273273
_cons	2.332697	.2444834	9.54	0.000	1.846064	2.819329

Table 8. Descriptive statistics—effectiveness of supply chain.

	Median	Mode	Skewness	IQR
Supply chain integration	4	4	-1.0	1
Competitiveness of suppliers	4	4	-0.7	1
Transparency in our supply chain	4	4	-0.8	2
Accountability in the supply chain	4	4	-1.0	1
External customer satisfaction	4	4	-0.6	1
Internal customer satisfaction	4	4	-0.6	1.25
Corruption levels in the county	3	4	-0.1	2
Procurement transaction costs	4	4	-0.6	1
Data integrity	4	4	-0.6	1
Audit trail	4	4	-0.5	1
Employee productivity	4	4	-0.2	1.75

percentage indicated that the level of accountability was to a great extent with a median and mode of 4. This shows that the supply chain processes and activities were to a great extent accountable and transparent.

On satisfaction, most of the respondents indicated that external customers were satisfied to a great extent. Similarly most of them indicated the internal customers were also satisfied to a great extent. This was confirmed by a median and mode of 4. The cost of procurement had gone down to a great extent according to most of the respondents. This shows that the supply chain processes in the county satisfied more people at relatively low costs. This is shown by a mean and median of 4.

A significant percentage of the respondents indicated that the supply chain processes in the County provided data integrity to great extent as well as an audit trail with both having a mean and median of 4. This shows that the processes had good data integrity and some sound trail of transaction which enabled easy auditing of the transactions. The productivity of the employees working with the supply chain in the County had improved to a great extent as indicated by approximately majority of the respondents. However, despite this very promising results, most of the respondents indicated that level of corruption in the county

had reduced. The median was 3 indicating that the central position of the respondents on corruption was that it was to a moderate extent although there was a variety of perceptions on this issue based on the IQR of 2.

4.4.2. Correlation

A Pearson correlation test was used to test the relationship between IFMIS and the effectiveness of supply chain activities in Kirinyaga County.

Table 9 shows the correlation results between different variables in this study. First, the study shows that there exists a significant positive relationship between effectiveness of the supply chain and EDRMS ($r = 0.396, p < 0.05$). The supply chain effectiveness and Internal controls had a significant positive correlation ($r = 0.599, p < 0.05$). Lastly supply chain effectiveness and e-purchasing had a significant positive effect ($r = 0.599, p < 0.05$). The study shows that the more the County used IFMIS (EDRMS, internal controls and e-purchasing) the more the County became effective in matters relating to supply chain.

4.4.3. Combined Effect Model (Multiple Linear Regression)

This section provides the results of a linear multiple regression (**Table 10**). This test was done to establish the combined effect of the three functions in IFMIS on the effectiveness of the supply chain processes in the County.

The resulting multiple linear regression equation was given as:

$$Z = 0.5286791 + 0.0855031X1 + 0.4674789X2 + 0.2469165X3$$

where, Z is the dependent variable (supply chain effectiveness); $X1$ is Electronic data records management; $X2$ is internal control systems and $X3$ is E-Purchasing.

Table 9. Correlations.

	Supply chain effectiveness	EDRMS	Internal controls	E-Purchasing
Supply chain effectiveness	1			
EDRMS	0.396**	1		
Internal controls	0.599**	0.490**	1	
E-Purchasing	0.559**	0.307**	0.468**	1

**Correlation is significant at the 0.01 level (2-tailed).

Table 10. Coefficients—multiple linear regression.

Robust regression		Number of obs = 81	
		F(3, 77) = 20.74	
		Prob > F = 0.0000	

Supply_chain_ef-s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
EDRMS	.0855031	.0991277	0.86	0.391	-.1118854 .2828916
Internal_controls	.4674789	.1274654	3.67	0.000	.2136628 .721295
E_purchasing	.2469165	.0709649	3.48	0.001	.1056073 .3882258
_cons	.5286791	.4533808	1.17	0.247	-.3741174 1.431476

The study shows that without the IFMIS the level of effectiveness would be insignificant or very low as shown by the constant value ($p > 0.05$). The EDRMS component was also insignificant implying it could essentially change or influence the effectiveness of the supply chain processes in the county. However, internal control had a significant effect on the supply chain. The result shows that an improvement in a unit of internal control holding other factors constant would increase the effectiveness of the supply chain by 0.47 units. Similarly, an increase in e-purchasing by one unit holding other factors would increase the effectiveness of the supply chain by 0.25 units. The results shows that some functions in the IFMIS such as internal controls ($p < 0.05$) and e-purchasing ($p < 0.05$) significantly affected the effectiveness of the supply chain activities in the County. The electronic documents and records management system had insignificant influence on the effectiveness of the supply chain processes in the County.

5. Discussion and Conclusion

5.1. Discussion of the Findings

The first hypothesis of the study was to determine the influence of Electronic Document and Records Management System (EDRMS) on the effectiveness of the supply chain activities in Kirinyaga County. Electronic Documents and Records Management System is a component in IFMIS, a system used by the National and County government to facilitate procurement, payment, and communication with stakeholders especially suppliers. Wainaina (2014) researched on the effects of IFMIS on Financial Performance of Commercial State Corporations in Kenya. Results indicated that 84.3% of the financial performance of commercial state corporations can be attributed to the Integrated Financial Management practices they have adopted. The study found that through IFMIS, users could store their documents electronically. This facilitated large storage of data in soft form compared to if the information was stored in hard form. The use of the system enabled easy access to information compared to hard form which was hard to find, and prone to mix up especially if the files were not well labeled [53].

The use of the IFMIS especially the EDRMS could be used for other purposes such as generating reports from the system and also by facilitating easy retrieval of information from the systems. Therefore the system facilitated easy transactions and eased the supply chain processes. This could significantly increase the efficiency of operations of the supply chain within the County. These findings agree with the views of Kwatsha (2010) who asserted that management of records would proper creation, maintenance, use and disposal of records to achieve efficient, transparent and accountable governance. The use of IFMIS also was useful for other stakeholders such as internal and external auditors. This is because the system provided for a way in which stored documents could easily be tracked [21]. Hendriks (2012) pointed out that IFMIS was an information

system that tracked financial events and summarizes financial information [3].

The findings shows that the system had also some control features as it only allowed only authorized people to modify the documents. This restricted unauthorized entry of people which could put the supply chain processes at risk. This is in accordance with Diamond & Khemani (2005) who argued for IFMIS to be effective, it required automating all repetitive operations in organisation, embedding authorizations, checks and controls [7]. However, the users of the system had mixed views on its security levels. A significant percentage of the users indicated that information stored in IFMIS could be corrupted or could get lost. This resonates with the views of Chêne (2009) who cited that IFMIS projects did not provide the expected results in developing countries, as institutional, political, technical and operational challenges affect its successful implementation [5].

A simple regression test was done to determine the effect of the Electronic Documents and Records Management system (EDRMS) on the effectiveness of the supply chain processes. The study found that EDRMS had a significant effect on the supply chain processes. Kwatsha (2010) argued that EDRMs prevented records modification, controlled record deletion and had an arrangement structure all which contributed towards making the operations effective. However, when other factors were put into the model, the effect of the EDRMS was found to be very insignificant [21].

The second hypothesis of the study was to determine the influence of internal controls on the effectiveness of the supply chain processes. Internal controls were inbuilt features for restricting access to the IFMIS, controlling the operational ability of a person on a system and usage of the system. According to Pathak (2005) proper internal controls ensure effective risk management. The study found that IFMIS had several internal control mechanism [30]. Firstly, the system had user passwords as a basic security operation feature to control access and prevent the basic or low level risks. The study found that IFMIS had allocated roles to different individual as well as segregating the duties to different people. This segregation of roles and duties ensured that no single person had the ability to carry out all the roles and operate them in the system. Also the segregation of duties such as entry, approval levels and authorization was a major security boost. These features were noted by Hendriks, (2012) who indicated that IFMIS had specifically embedded internal controls including segregation of duties and access controls such as passwords and user names with the intent of curbing fraud and increasing efficiency and effectiveness in the supply chain [3].

In that connection also, the study found that users could only carry out certain number of tasks allocated to them. All these controls ensured that transactions could not go through the entire processes without approvals from different people which lowered the risks of fraud and misappropriation of funds. According to Hendriks (2012), some controls such different levels of authority and approval and control of the flow of information was meant to make supply chain

operations effective and efficient [3]. The study noted that internal controls in IFMIS monitored the procurement process which made users to be more vigilant when doing procurement related activities. The system also provided audit trail and trackers to track all the activities happening within the system. A similar assertion was made by Rodin-Brown (2008) who argued that IFMIS would provide and support audit by providing the required audit trail. In general, internal controls in IFMIS promoted accountability among the supply chain staff and stakeholders [4].

However, despite the positive implications of the system, the study found that the system could not adequately detect or report fraud. Similar perceptions were expressed by Kahari, Gathogo and Wanyoike (2015) who said that reports were indicating high corruption levels in the counties, high levels of manipulation of systems, fraud and inefficiencies in counties [10]. A regression test done on the effect of internal control on the effectiveness of the supply chain indicated that there existed significant statistical effect of internal control on the effectiveness of the supply chain processes. This aspect was also significant when combined with other aspects of IFMIS implying that internal controls had a significant influence on the supply chain processes. Ayagre, Appiah-Gyamerah and Nartey (2014) held that internal control systems represented all the approved policies and procedures which the top leadership used in order to achieve an effective management of business [31].

The third hypothesis of the study was on the e-purchasing component of IFMIS and how it related with the effectiveness of the supply chain processes. According to Chartered Institute of Purchasing and Supply (2012c) e-purchasing operates the transactional aspects of requisitioning, authorizing, ordering, receipting and payment processes for the required services or products [34]. The study found that IFMIS through the e-purchasing component, users could electronically search for new supplier in the system which shortened the time taken to make searches and made the processes more convenient. Secondly, the use of e-purchasing component of the IFMIS system enabled the users to interact with the suppliers electronically. The findings resonate with those of Dong *et al.*, (2009) who argued that having e-procurement system enhances efficient flow of information between buyers and suppliers, which reduces administration costs and time, allowing procurement professionals time to focus on more strategic greater value adding activities [45].

The study noted that e-purchasing enabled the users to evaluate the capabilities of new suppliers and their locations. However, the extent of evaluation on capabilities was limited since the system only relied on the information provided and some information provided may have been altered or fabricated to suit the context and situation as at then. Dong *et al.*, (2009) held that e-procurement enhanced efficient flow of information between buyers and suppliers, which reduces administration costs and time, allowing procurement professionals time to focus on more strategic greater value adding activities [45]. The system was

found to ease the process of procurement and other supply chain processes. The findings shows that users could float tenders through the system, order for goods and services and also facilitate approvals electronically. All these activities could be done in the system electronically reducing the manual way which was time consuming, inefficient and ineffective. According to Sain *et al.*, (2004) e-procurement considered an electronic integration and management procurement activities, including purchase request, authorization, ordering, delivery and payment between a purchaser and a supplier [48].

The study also noted that the e-purchasing was an important tool in the supply chain management in the county as it facilitated most of the roles and duties. The users of the system indicated that they could send invoices to the suppliers and process payments to them in the system. These findings agree with those of Min and Galle (2003) that electronic procurement is business-to-business purchasing practice that utilizes electronic commerce to identify potential sources of supply, to obtain organisational needs, to pay, and to interact with suppliers [54]. Results from the simple and multiple linear regression tests shows the use and application of e-purchasing service in IFMIS had significant statistical effect on the effectiveness of the supply chain processes.

5.2. Conclusion

The study concluded that Electronic Documents and Record Management Systems influence supply chain processes through ease of access of information, quick retrievals, easy tracking of documents and provision of audit trail among others. Internal controls influence the effectiveness of supply chain through enhanced security. The system provides restricted access, creates order of operations, defines roles and duties, which reduces the level of risk in the organization. However, the users doubted the system's ability to detect and report fraud cases. The e-purchasing component facilitated quick, easy and processing of procurement logistics such as floating of tenders, ordering of goods and services, invoicing and processing of payments all of which increase the effectiveness of the supply chain operations.

5.3. Implications of the Study in Theory and Practice

In theory, there is need for more research to determine why the IFMIS system may not have been very effective in reducing corruption and improving on the audit trail. Most institutions especially government will invest in an IFMIS with corruption as a major reason.

The study also reaffirms the importance of the IFMIS, however there is need for more studies on the implementation of the system and user training.

In practice, organisations should implement ICT systems to ensure effectiveness in their supply chains. It should also be noted that there is a human aspect in success of any ICT system. ICT Systems always use the Garbage In Garbage Out principle.

5.4. Contributions of the Study to Practice and Theory

The study makes a very important contribution to procurement practice. Firstly, the study provides information on the available internal control and extent of adoption of e-procurement which shows the level of non-compliance to the legal and ethical framework which is very vital to the policy makers such as Public Procurement Regulatory Authority in Kenya as they streamline public procurement in the country.

The study also revealed the factors affecting the implementation of IFMIS among the Counties in Kenya. Such information is helpful to the IFMIS directorate that allow easy, faster and cheaper ways of diffusing technology in the government supply chain.

The study also provides more knowledge on the better and sustainable Supply Chain concepts such as integration of technology in the process of supply chain process. This provides more content to the field and how new approach to the field of supply chain especially in third world countries.

5.5. Limitations of the Study

This study collected data on IFMIS and effectiveness of supply chain from the County government of Kirinyaga only. This information is thus from one county government. However, in Kenya, the Counties are not identical and have different levels of economic, social and political structures. Thus the findings and the conclusions may not cut across all the counties and thus highly reliable for generalization.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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