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Effectiveness of Integrated Financial Management System in enhancing governance in county governments in Kenya.

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Effectiveness of Integrated Financial Management System in Enhancing Governance in County Governments in Kenya.

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I dedicate this work to everyone who has supported me in whichever way throughout this endeavour. Special dedication goes to my family for their hope and resilience, and to friends and colleagues with whom we have always shared ideas. I would not have come this far without much sacrifices and support from you all. May the Lord God bless you abundantly.

DECLARATION

I declare that this work has not been submitted anywhere previously for the award of any degree in any University. This thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Approvals

This thesis has been submitted for examination with my approval as the University Supervisor.

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ABSTRACT

Management of funds is one of the most sensitive issues in governance especially in a country where corruption is actually a national disaster (Transparency International 2013). This calls for transparency and accountability in Public Financial Management (PFM) and associated financial systems such as Integrated Financial Management System (IFMIS) to ensure financial systems deliver the desired outcome. In Kenya, the problems of financial misappropriation, embezzlement of funds and lack of transparency in financial management right from the national government to the devolved governments is the main cause of poor governance. Although IFMIS was adopted to help improve on governance of county resources, the use of the system has not functioned to the expectation as the issue of poor governance as a result of poor fund management and unequal allocation of resources either due to lack of requisite information, overspending due to suspicious payments and compromised records that cannot be accounted still exists. This study therefore sought to examine the Effectiveness of Integrated Financial Management System in enhancing governance in county governments in Kenya. Guided by this broad objective, the study sought to examine the effectiveness of IFMIS in public financial management, IFMIS technical security risks challenges towards good governance and lastly IFMIS technical security risks controls towards good governance. The study was grounded on Technical Acceptance Model and employed descriptive cross- sectional research design. The study was quantitative in nature and a total sample of 235 respondents comprising of county executives, County finance ministers and county finance officers (planning, administration and human resource) selected purposively from all counties were selected. The study utilized primary data collected through self-administered questionnaires. A pilot test was conducted to ensure data validity and reliability. The data was analysed using SPSS for both descriptive analysis and inferential computation and results were presented in tables and charts. The results indicate that there is a positive significant association and high relationship between effective IFMIS use and good governance as IFMIS ensures real time financial transactions, automated reports and data validation. A majority of the respondents also agreed that password sharing, unsecured access points and data input errors are the main forms of IFMIS technical security risks and as such the study found out that continuous staff training, restricted sharing of passwords and continuous data back up as the surest ways of IFMIS technical security risks controls to ensure good pubic financial resource management for good governance. The study recommends that for county governments should deliberately ensure all public financial transactions are carried out through the IFMIS system and that future plans and spending of county governments should be informed by IFMIS financial reports. Furthermore, to ensure safety and integrity of data, passwords should be restricted to one user per log and that immediate users undergo continuous training on data entry and system security to mitigate data loss and wrong entry.

Key Words: Information Financial Information System, Governance, Public Financial Management

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ABBREVIATIONS AND ACRONYMS

ANOVA	-	Analysis of Variance
CRA	-	Committee for Revenue Allocation
GoK	-	Government of Kenya
ICS	-	Information Control Services
ICT	-	Information Communication Technology
IFMIS	-	Integrated Financial Management System
IS	-	Information Security
ISP	-	Information Security Policy
IT	-	Information Technology
MDGs	-	Millennium Development Goals
PFM	-	Public Financial Management
PFMR	-	Public Financial Management Reforms
PIN	-	Personal Identification Number
SDGs	-	Sustainable Development Goals
SPSS	-	Statistical Package for Social Sciences
TAM	-	Technology Acceptance Model
USAID	-	United States Agency for International Development

CHAPTER ONE: INTRODUCTION

1.1 Background of Study

Public Finance Management refers to the set of laws, rules, systems and processes used by an independent nation to mobilize revenue, allocate public funds, and undertake public spending, account for funds and audit results (Apaza, 2012). Developing countries have undertaken key steps to computerize major government operations mostly in the field of Public Financial Management (PFM) aimed at supporting the achievement of fiscal discipline, strategic and efficient allocation and use of funds, value for money and probity in the use of public funds. This is supported by the commonwealth secretariat that observes that the realization of Sustainable Development Goals (SDGs) and more specifically on goal 16 that touches on just, peaceful and inclusive society is possible if openness and accountability measures are implemented in the management of public finances (Commonwealth Secretariat, 2015).

Globally, public financial management guidelines establish a framework for achieving four aims of a well- functioning public financial management system. This include attaining macro fiscal stability, enhancing the allocation of budgetary resources, improving the efficiency of spending, and lastly, ensuring that cash is managed optimally. The guidelines were adopted from the report of the Commonwealth Secretary-General on how democracy and development can be promoted in the respective countries, which emphasized that development in poor countries lies in the process of government revenue expenditure and sound and accountable system for drawing up budgets, implementing, and monitoring their impact (Ann, 2012).

Ideally, effective public finance management reforms are essential in promoting accountability and transparency globally to ensure financial efficiency (John & Ambrose, 2015). Effective Public Financial Management Reforms (PFMR) must be able to provide solutions to fundamental goals of government institutions with a mandate to serve the public with preference in promoting efficiency and minimizing wastage of resources (Moses & Mutua, 2016). Globally, public financial reforms were triggered by many factors, with some specific to respective countries (Julias & Kalundu, 2014). For instance, fiscal crisis facilitated the reforms in Canada, the United Kingdom (UK), Argentina and Asian (Casals, 2009). In South Africa and former Soviet Unions, political changes played significant influence in bringing the reforms Fredrick & Sarah (2014), while in Colombia

and Canada, public pressure are the contributing factors and post conflict brought reforms in states such as Rwanda and Afghanistan (Naomi, 2014). Philippines, Mexico, Korea and Chile typically adopted the use of systems due to technological advancements while studies show that, third world countries that are highly indebted embraced the reforms due to donor pressures (USAID, 2008).

Irrespective of the factors behind the adoption of PFMR that introduced Integrated Financial Management Information Systems (IFMIS), behind every nation that has embraced the technology lies the objective of promoting efficiency in public administration and hence realigning territorial strategies towards the realization of the MDG's (John & Eva, 2014). Despite the importance and benefits that most countries anticipate from the implementation of such systems, there are still many security challenges that face the system, and therefore hinder full adoption of IFMIS (Kinyeki & Kipsang, 2008). For instance, the study by Kinyeki & Kipsang (2008) on IFMIS and the quality of budgetary allocation in the county government of Siaya, observed that the initial impact of computers is indirect. Their primary impact is to strengthen the manual accounts that the ministries rely upon. Second, is to promote effectiveness reforms by changing procedures, rather than efficiency reforms by accelerating the throughput of data with existing procedures. Third, computers do not initially promote document processing but they improve data processing. Fourth, computers promote rudimentary analysis.

In general, on the global perspective, the most successful nations in terms of implementing the integrated financial management systems are those from the developed economies, and consequently they have reported reduction in corruption and promotion of effective service delivery (USAID, 2008).

In Africa, IFMIS adoption has been witnessed in some countries through aid from foreign nations and efforts have been put to promote the adoption and ensure that resistance is discouraged (Esther, 2008). For instance, South Africa has demonstrated full implementation of the system with great success (Haruna & Doorgapersad, 2016). An Integrated Financial Management Information System (IFMIS) has been adopted as a preferred financial management reforms practice to promote data security, accountability, efficiency and effectiveness in financial tracking and reporting (Diamond & Khemani, 2005). Generally, African countries have been at the forefront of encouraging an upgrade of their PF practices. However, various problems have arisen ranging from poor

administration and management of public finances, misappropriation and corruption (Campos & Pradham, 2007).

In Kenya like many other countries across the world, drastic revolution in financial management has been influenced by emerging shift towards IFMIS adoption across many state owned corporations including ministries and commissions (Noah, 2015). Additionally, the need for use of integrated financial management systems has been enhanced further due to the advancement in information communication technology (ICT), which is as a result of global transfer of technological know-how, skills and techniques as a result of international trade (Naomi, 2014).

Although the adoption of IFMIS is considered as fundamental in reforming public service sector, the use has been faced with a number of challenges that are making the system not to achieve its desired purpose, hence fewer benefits. A survey done in Kenya by the Auditor general in 2015 showed that there is a wide gap between the finances received by state corporations and the results provided as to how this finance had been used (Moses & Mutua, 2016). For instance, the audit of the financial statements for the year ended 30 June (2015) indicated that out of the 252 financial statements audited; only 6% had a clean (unqualified) audit reports while 51%, 10% and 33% had qualified, adverse and disclaimer of opinion reports respectively (Transparency International, 2013). Parastatal just like any other public entities are established and run using the taxpayers' money. As such, taxpayers have a right to demand prudential management of finances in the public sector. Against this backdrop, the management of finances in the public sector is more often than not questionable (John & Ambrose, 2015).

Integrated financial management information system is a computerized application system that has been adopted by many government ministries, departments and agencies to automate the main elements of the budget execution and accounting processes and operations (Cangiano, 2019). The adoption and utilization of IFMIS benefits the public and the government by providing real-time financial information to all those finance and accounting managers who need it. It also makes it easy to shared financial information to different staff by a click of a button, hence making it easier to develop budgets, account and trace all resources through the use of centralized treasury processing operations. Government departments use the IFMIS system to prepare financial reports and statements for the different activities handled in one office or

department. According to Mbaka and Namada (2019) IFMIS refers more specifically to the computerization of the public financial management processes, from budget preparation and execution to accounting and reporting, with the help of an integrated system for financial management of line ministries, spending agencies and other public sector operations.

The system captures all the functional processes, and the relevant financial flows, within public expenditure management. The IFMIS system is beneficial as it is able to reduce political discretion and acting as a deterrent to corruption and fraud and since it can share real-time financial information; there is more transparency, monitoring and control and accountability of resources (Ibrahim, 2017). At the same time, the IFMIS system can be used for basic general ledger accounting to complex operations like budgeting for account receivables and payables for the entire economy as broken down into departments and industry. It is also does the controlling of debt, asset and liability management, it also helps in management of revenues, procurement and it management of human resources and the entire government payroll systems. Ndegwa and Mungai (2019) the system is able to track financial activities, summarize the information and share it with the necessary units.

As any other system, it can only be effective and perform as per its expectations with the presence of other aspects like competent staff who are tech-savvy and can operate the system to maximum efficiency (Opiyo, 2017). The management must also be supportive and commitment to the adoption and usage of financial management systems, by sourcing for funds to invest in technological infrastructure and its safety. Looking at the top leadership in any organization, the structure and culture they adapt within their organization will allow the thriving of IFMIS and other technological systems and applications. An open culture and organizational structure would be open to use of modern and advanced systems to enhance its processes and systems productivity (Asmorowati, Setijaningrum, Suaedi & Dewi, 2019).

In financial management, the aspect of record keeping and reporting comes in handy and the use of information and technological systems allows for ease in interaction, networking and sharing of data. Financial reporting using technology and internet allows for real-time information sharing which makes audit trailing accurate as all the transactions are recorded and can easily be accessed (Mbaka & Namada, 2019). This

then means that monitoring and controls systems will be accurate and transparency which is needed when handling public resources. As such this study looked into IFMIS and how it impacts on the performance of organization. It will explore the aspect of internal control systems, staff competence in technological usage, budgeting and financial reporting using technological application and systems.

Apaza (2012) argues that, although many researches have been carried out in (ICT) and public finance reforms, and most of them show positive outcome, several challenges are still experienced. IT risks are the potentiality for unplanned events involving a failure or misuse of IT to threaten an organization's objectives, with the business consequences, enterprises must change the way they manage it (Westerman & Hunter, 2007). These risks are categorized into two: Human errors, which include erroneous activities by those, tasked to manage IFMIS, example: careless data entry and computer related risks arising from software or hardware that form the IFMIS, and/or IFMIS environment like computer viruses, system failure, hacking.

Adoption of Information Technology (IT) has increased steadily as every organization is investing heavily on it because of the numerous benefits which come with the use of IT. There are risks, which come with the use of IT, which many organizations are facing such as lack of necessary skills and knowledge to use the systems and lack of experience among others. Technology changes also pose a threat towards IFMIS use and exposes the system to fraud and hacking (Merna & Al-Thani, 2008), which calls for continuous training of staff, which is costly. According to Taylor and Fleming (1999), one of the main risks of implementing integrated financial systems is the fact that different fragmented agencies and their managers brought together by integrated system become, in a sense, "lame ducks." There is therefore a need to create a single integrated agency.

Another major risk is the collapse of existing independent systems, which may be caused by poor implementation of IFMIS or inconsistency in data sharing among the different components of the system. This can be mitigated through proper testing of the independent modules at each stage of integration. Vickery et al. (2003) while contributing to the same pointed out the long and slow pace of transition as a risk, which may cripple processes in the affected entities almost bringing operations to a standstill. This can be mitigated by making sure that there is effective work plan, which includes all details of the transition. Taylor and Fleming (2001) point out that, management should establish

ways of dealing with challenges brought about by the integrated agency. Integrated agencies can bring about staff dislocation and change of culture; if these challenges are not dealt with effectively then they interfere with the performance of the agencies. IFMIS also faces the security risk through hacking and denial of service and this may affect efficient access and provision of services to customer. Other security risks reported include sabotage and fraud involving these systems. This can be mitigated by strengthening the security infrastructure where these systems are running (Stern, 2002).

Internal controls are measures that the management of an organization puts in place to ensure all operations, processes, systems and staff works to achieve the mission and goals of the organization (Davila, Gupta & Palmer, 2018). It also refers to mechanisms that the top leadership puts in place to avoid theft, wastages and mismanagement of resources. Therefore, any organization in serious pursuit of its goals and objectives must critically look at its internal control systems as they are important aspects in measuring the progress of the organization.

According to Ibrahim, Diibuzie and Abubakari (2017) in their study on internal control systems and financial performance of the health institutions in Ghana, revealing that an effective internal control system is likely to prevent opportunities of fraud and corrupt activities within the institutions of health. An effective internal control system is one that will consider the control environment that will assess both the internal and external environment of the organization; it has indicators of risk assessment and control activities to avoid losses and theft. The internal control system that uses information and communication tools yielded higher results as the health organizations noted areas of concern and communicate the same to staff and managers as a push towards achieving its goals. The monitoring aspect would assess all areas of operations within the health institution and consolidate efforts to achieve high financial performance. The 16 study findings show that internal control systems and its indicators were positively linked to financial performance of the health institutions in Ghana.

Muhunyo and Jagongo (2018) investigated on internal control systems and financial performance, sharing that many public institutions have poor financial performance as compared to the private sectors. In an effort to improve the financial performance of the public institutions, it was suggested the adoption of strong internal control systems. The internal control system will cover aspects like internal audit of all resources and its assets, policies and regulations and assessment of the operations and its evaluation. The public

institutions share that some employees do not take regular leaves or are not rotated to other departments, since they handle organizational cash and capital assets, which will give them room for fraud and corrupt activities. Adoption of an effective internal control system, will ensure that all employees are closely monitoring and regular audits are conducted leading to better usage of funds and other organizational resources. The study found that the control environment, risk assessment, control activities and information and communication as indicators of internal control systems have a significant influence on the financial performance of the institutions of higher. Such that to improve the financial performance of the public institutions, these institutions have developed an internal control system that allows for transparency and accountability of resources.

Umar and Dikko (2018) investigated on internal control and performance of the Nigerian commercial banks, revealing that the recent spate of fraudulent activities, globalization process and the complexity of banking transactions has led to keener interest in the internal control systems as a solution. The shake-ups and challenges facing the banking industry have pushed authorities to look at individual banks' internal control system to avoid issues like theft and fraud. This can be achieved through the aspect of monitoring and control activities to protect the industry and lead it to success. The control environment looks at the organizational culture and structure to push the banks to high performance by calculating what risks to take and seek and take opportunities that improve their returns. The study findings show that internal control system seen through control environment, control activities, monitoring and risk assessment significantly and positively influenced the performance of the Nigerian commercial banks. Information and communication had little impact on the performance of the banks.

Lerno (2016) linked the internal controls and performance within the county government in Kenya. The study revealed that internal control operates using its five main components; namely risk assessment, control environment, control activities, communication and monitoring and evaluation aspects. The study revealed that many of the staff from the 47 counties had no idea if the county had an internal control system and whether it was effective or not. Some of the counties that had adopted internal control practices still shared that they could not link it increase in asset base, recognition of the value of receipt and expenditure of big contracts and improvement in collection of levies to cover the county expenses as to when they fall due. In general, the study found out

that internal control practices in the county governments had not led to improved performance at the county level.

Dubihlela and Nqala (2017) on internal control systems and risk performance, sharing the manufacturing firms are shifting their attention to measures to protect themselves against risk exposures. The study aims at how to optimize the internal control systems to mitigate risks that the small and medium sized manufacturing firms face. The study found that a strong internal control system can help the SMEs to identify, mitigate, plan on how to handle the different risks that they face. The internal control system will inform the management team who will respond by making contingency plans and protect the firm from the risks. At the same time, the organization can come up with appropriate risk management strategies, which would lead to improved performance.

Good governance within the study context of government agencies, institutions and departments, revolves around the ability of the leadership team to source for resources, through writing its requisition to the national government and sound of using the resources. At times the resources are used by the government ministries in investment portfolios that earn them an income that will be used in performing their mandates and objectives (Martinez, 2019). Some of the more common measures of good governance is service delivery, improvement of the economy, sound use of resources and infrastructure development. The measurement is done through key performance indicator (KPI) and balanced scorecard (BSC) metrics that look at human attributes that contribute to overall improved performance.

To be able to achieve high performance, the government institutions must have a sound budgeting team that is able to effect internal controls of resources including human capital and report on the financial outcomes. Governments run with tight budgets, hence there is an increasing demand to re-examine their spending priorities; the financial reporting system should cut out misappropriation of funds and inefficiencies in the operating systems (Wilson, 2019). In this case, governance will be measured in terms of prudent financial resource usage, accurate and transparent financial records and internal control systems that track all the finances in the department.

1.2 Statement of the Problem

Adoption of integrated financial management and information system (IFMIS) is for effective management and sourcing procedures within the government, streamlining the financial processes and provision of standard, real-time and accurate financial statements. The aim was to cut down on corruption and fraudulent activities, reduce ethical issues by ensuring transparency and accountability and cut down instances of bad governing practices like unfairness. But the challenges associated with financial management are still prevalent as seen through misuse of financial resources, increased cases of collusion and corruption among senior management and inefficiencies within the internal control systems.

The system has been in place for more than 10 years and its expectations have not been met, since there is misappropriation of fund where billions of shillings are lost in corruption and fraud. Case in point, the “KEMSA COVID-19 Billionaires” where funds that were set aside for purchase of virus Personal Protective Equipment ended up being embezzled by few people in the procurement at the Ministry of Health. Audit general report (2020) indicate that approximately KES. 7.8 Billion was stolen by individuals where the individuals bypassed the IFMIS system to procure and under-supply overpriced goods.

Acceptability of IFMIS, like any other information system, was dependent on perceived usefulness and ease of use and to the best of researcher knowledge, none of past studies tried to find out how the IFMIS feature, security risks as well as controls would promote good governance. For instance, studies by Ibrahim (2017) on IFMIS adoption at Garissa County, Mburu and Ngahu (2016) on IFMIS and financial management within Nakuru County and Njeru and Malenya (2019) on IFMIS and financial service delivery in Kakamega County; all reveal that misappropriation of funds still continues to be rampant at the county level. The study thus sought to assess effectiveness of IFMIS in enhancing good governance in county governments in Kenya.

1.3 Research Objectives

1.3.1 General Research Objective

The general study objective was to look at the effectiveness of IFMIS in enhancing good governance in county governments' in Kenya

1.3.2 Specific Research Objectives

The following specific objectives guided the research:

i. To establish effect of IFMIS features in enhancing good governance in county governments in Kenya
ii. To establish IFMIS security risks in relation to good governance in county governments in Kenya.
iii. To establish IFMIS security risk controls in relation to good governance.

1.4 Research Questions

The study sought to answer the following research questions:

i. To what extent is IFMIS features effective in enhancing good governance in county governments in Kenya?
ii. What are the security risks associated with use of IFMIS in public financial management towards good governance?
iii. What is the impact of IFMIS security risk controls in relation to good governance in county governments in Kenya?

1.5 Scope of the Study

The scope of the study was all the county governments in Kenya with particular interest to county staff in the finance departments who use IFMIS for their day to day work. This is because county government are the primary users of the integrated financial management systems hence the study on effectiveness of IFMIS in enhancing transparency and accountability in management of financial resources in county governments. For this study, 5 respondents were purposively selected from each county to take part in the study. To effect this, the researcher picked 1 county executive, 2 finance officers, and 2 accountants from each county totalling to a sample size of 235 respondents all who formed the study target population.

This sample was considered representative enough to answer the research questions for the study. This study was undertaken between September 2020 and July 2022. Constrained by time and the wide geographical distribution of all county headquarter offices; the researcher adopted 5 respondents who frequently use the system who were given the questionnaire for response.

1.6 Significance of the Study

The study will be of significance to the academic fraternity as it would expand the existing knowledge on the relationship of integrated financial management information system features and good governance. It would also suggest areas of studies for future researchers besides being cited as empirical evidence by future scholars and researchers. The study will also be used as a source of referencing material for future scholars. The study would be relevant to accountants and other officers in government ministries, departments and offices in realizing the benefits of integrated financial and accounting operations through the use of integrated financial management information systems and the skills and security required. This would help them understand the role of IFMIS on operational efficiency and overall governance of county financial resources.

The county governments will benefit more by ensuring all financial transactions are captured on IFMIS and thus decisions made on governance are sound and backed by verifiable financial documents that are of high integrity. Study results will enable county governments identify threats to IFMIS system and best solutions to address the same and this in totality will help improve efficiency and reliability of the system in managing county financial resources

1.7 Limitation of the Study

The study aimed to assess effectiveness of IFMIS in enhancing good governance in county governments in Kenya. The study was also limited to the structure of the research instruments where answers were confined within the structure. This applied to the questionnaires where quantitative data were collected in a structured format thereby denying a chance to other opinions outside the confines of the structured questions. To address this, the researcher left respondents his contact information included email and telephone number for any clarifications.

Filling and returning the questionnaires depended on the willingness of the respondents and time at their disposal. To address this, the researcher adopted the “drop and pick” technique where respondents were allowed ample time with the questionnaire and responded to the same at their convenience after which they informed the researcher when dully filled for collection.

The reliability of instruments could not be absolute, and so the research was limited to the degree of instrument reliability. To address this limitation, the study subjected the data collection instrument to the Cronbach test of reliability, the outcome of which indicated that all scales were above the threshold and therefore reliable for data collection.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter covers literature pertaining to effectiveness of IFMIS in enhancing transparency and accountability. To begin with, first part of literature review highlights the theory underpinning the study, followed by empirical studies in relation to the research context and objectives and summary of the chapter.

2.2 Theories Underpinning the Study

For better understanding of the study, the research was guided by the following underlying technological theory that helped explain the effectiveness of IFMIS in enhancing transparency and accountability in county governments.

2.2.1 Technical Acceptance Model

Technology Acceptance Model (TAM) theory was first developed by Fred Davis in 1986. The theory focuses on usefulness and perceives ease of use as a determinant of individual intention to system usage. In the theory, the intention to use a system serves as a link of use of actual system. According to Davis (1986), perceived usefulness is defined as the degree to which an individual believes that using a specific system to perform a task enhances and contributes to total effect on performance. On the other hand, perceived ease of use is the intention of a person to use a system, create a short cut in that no effort would be used in completing the said task.

The author further implies that adoption will only be successful and fully create a significant effect only if there is a perception that technology increases performance and helps in making the operation less complex (David, 1989). A replication of the work of Davis Adams (1992) was criticized by Segars and Grover (1993), and the critic was on the measurement model used and postulated a new model based on three factors that consisted of usefulness of system, effectiveness, and ease to use. The authors deduced that ease of use and perceived performance was vital for use of new technology.

This theory is therefore relevant and related to the study's' research topic as adoption of IFMIS as a system in public financial management has a perceived role of improving

performance on public financial services more so on the issues of accountability and transparency. In this context, TAM utilizes parameters that include increasing speed thus creating effectiveness, making work easier to increase production through adoption of IFMIS. This helped to answer the research objectives on effectiveness of IFMIS, technical security risks associated with its use and effectiveness of risk countermeasures.

2.3 Empirical Review

The empirical review provides an overview of various studies on IFMIS effectiveness in managing public finances, the risks associated with the use of IFMIS and lastly the counter measures on how to mitigate the risks in order to ensure accountability and transparency of the system in managing public financial resources.

2.3.1 Effect of IFMIS Features in Enhancing Good Governance in County Governments

Njonde (2014) on his research on IFMIS effectiveness and public sector performance in Kenya found that established IFMIS promote effective financial reporting, internal controls, and government projects budgeting and implementation. The research further discovered a positive relationship between IFMIS effectiveness and management of public finances. Chene (2009) argues that, use of IFMIS has improved accountability of public finances. He concurs that a well-designed IFMIS can provide a number of features that may help detect excessive payments, fraud, and theft. These include, use of automated identification of exceptions to normal operations, patterns of suspicious activities, automated cross-referencing of personal identification numbers for fraud, cross referencing of asset inventories with equipment purchase to detect theft, automated cash disbursement rules and identification of ghost workers.

On the other hand, Diamond and Khemani (2013) argue that, for the systems to be effective there is a need to have a commitment by users to ensure success of the implementation of an IFMIS. Experience indicates that the best-designed project fail without firm commitment from all stakeholders involved. This now confirms that IFMIS accountability is relative to its users. Therefore, financial systems reforms implementation calls for consolidation and compilation of dispersed data across different fiscal units into one manageable unit. Wamsteker (1989) observes that to standardize government financial accounting and processes, there is need to have an elaborate policy framework

that guides computerization of transactions and upgrading of systems. The ability to identify simultaneous unique operations allows for appropriate processing of government transactions efficiently and apply necessary controls in exceptional cases thus enabling accurate transaction classification and posting (Neely, 2007).

Diamond and Khemani, (2005) observes that IFMIS makes it possible to generate different types of reports based on the need at hand such as performance reports on projects, cash and payable reports, costs and returns on investment reports as well as balance sheets to show financial standing of institutions. The reports are displayed in different formats based on user priority and even visualized to predict how actions can influence future outcomes. The library utility on the system contains report templates that can be tailored to plan and formulate budget, to track and monitor cash and payables and to examine performance of projects. IFMIS bundles up all financial management functions into one set of applications that is capable of keeping trails of all transaction details including authorization for exception, budget requests and budget spending to enhance efficiency in resource utilization (Olabisi and Oladosu, 2017).

Financial tracking enables county governments know what amount is being spent on which project and at the same time identify what has been paid for and for which service. This in-turn boosts revenue collection as all payments are centralized in one system. For instance, payments for land rates are classified under lands, payment for parking fee classified as parking, and payment for construction approvals categorized accordingly. Chado (2015) has a different look at the effectiveness of IFMIS as a system but rather processes that are involved with the use of the system. This is evident when the author in his study asserts that, IFMIS practices are suitable in enhancing optimal resource allocation within public institutions and the central government.

According to the author, policies and procedures on bookkeeping, reporting and performance monitoring put in place ensure security of IFMIS processes and functionality against risks thus ensuring enhanced allocation of resources to meet set objectives of the government. For the case of county governments, IFMIS ensures priority on projects is well-informed and equitable allocation of funds. For instance, construction of roads within counties, health management, and bursary allocation can all be handled by the system to ensure maximum utilization of funds at minimal cost. Bosire (2016) tends to resonate with Chado (2015) in his study, which puts much emphasis on the people and

processes in place over the system to ensure optimal output of the system. The author asserts that financial probity in fiscal environment is exhibited when financial transactions are carried out in an ethical, prudent, effective, lawful, and transparent manner, such that the procedures are appropriately supported by a robust risk management strategy. In such cases, public resource wastage is minimized and instances of unauthorized expenditure reduced. In general the research is in agreement with all the authors Chene (2009), Diamond and Khemani, (2005),

Automated IFMIS system that supports sophisticated document management, computerized payment, and intelligent user identification has demonstrated enhanced general efficiency, data security, and effectiveness of financial reforms. Such a system thus enhances transparency and accountability. The research on the works by (Njeri, 2016), Chado (2015) and Bosire (2016) aim to look at effectiveness of IFMIS in enhancing accountability and transparency which is a combination of system and human actions.

2.3.2 IFMIS Technical Security Risks in Relation to Good Governance

Hendriks (2012) conducted a study to identify the challenges and risks that are involved in the implementation of the IFMIS in South Africa in order to develop guidelines that make the implementation more successful. The study used literature study methodology where theories were explored and used to solve a research problem. Based on the theoretical research, solutions and guidelines were developed to solve challenges and risks experienced. The study found that the sheer size and complexity of an IFMIS poses significant challenges and a number of risks to the implementation process.

There are, however, critical success factors or best practices that can be used for the project to succeed. Eisenstat (2003) found that IT infrastructure plays an important role in IFMIS implementation for improved procurement performance. This hence informs the second study objective on IFMIS technology risks. This provided a clear impetus on security risks to consider while setting up the system to realize the full potential of the system. To answer this, the study looked at various risks that are likely to pose a threat to IFMIS accountability and transparency which include:

2.3.2.1 Strategic Risk of IT

In a dynamic world, ineffective IT strategy becomes among the top threats that a financial organisation faces when trying to balance the risk of whether to adopt a new technology or simply ignoring it and watching events as they settle (Deloitte, 2018). This leads to disintegration between financial systems and expected output. A sound IFMIS system should provide for an enabling environment for agile responses to development of technology in the market. Andries (2018) observes that the complexity of IFMIS system arising from integration of previously installed systems such as Public Financial Management Systems and Electronic Financial Management system make hamstrung county governments by their own technologies. This gridlock arising out of technological preferences causes the differences in financial departmental management of financial resources thus compromising the agenda of counties. As a result, this leads to poor decision-making, as there is no clear information thus inequitable sharing of resources, which in turn causes alarm when it comes to transparency.

2.3.2.2 Cyber Security Risks

Use of IT has increased steadily as every organization is investing heavily on it. This has been necessitated by the benefits that come with the use of Information Technology. There are risks which many organizations are facing that come with the use of IT and since many organizations today rely on use of information system. Cyber security has become a key concern when it comes to financial systems. These range from cyber-attacks, breaches in data privacy and human misconduct. The most common information security threats according to Leonard (2018) include Trojan horse, malware and spyware: programs that monitor online activities of target systems or installs background programs overlaying the main system without consent to capture personal information, computer viruses: programs that alter the way a computer operates without the permission or knowledge of the user. Normally, the virus replicates and executes itself, usually doing damage to the computer in the process, phishing: phishers masquerading as a trustworthy person or business, attempt to steal sensitive financial or personal information through fraudulent email or instant messages, and Fraud: user of system altering information for personal benefit (Leonard, 2018)

According to the Kenya Cyber Security Report of 2016 by Serianu Ltd. in partnership with United States International University-Africa, the financial sector is the most affected

sector by cybercrime. The report further indicated that there has been a growth in the cybercriminal activity in Kenya targeting both public and private organizations (Kaimba et al, 2016). Cyber-attack on IFMIS poses a security risk through hacking and denial of service and this may affect efficient access and provision of services to customer.

2.3.2.3 Human-Error Risk

In a security context, human error means unintentional actions, or lack of action by employees and users that cause, spread, or allow a security breach to take place. This encompasses a vast range of actions from downloading a malware-infected attachment to failing to use a strong password which is part of the reason why it can be so difficult to address.

Eshung (2014) observes that, writing down login data increase the chance of security breach. Many end users of information systems fail to adhere to basic security protocols such as logging out of a computer and using a password which is quite surprising and not strong. Workers leave their computers logged on and unattended to when they are out of the office. Again, employees tend to forget to log off their laptops or desktop computers whenever they leave their workstations, which pose the undeterred risk of unauthorized access to data. Yet again, system login details are stored on devices or written down by employees on or near their desktops, which could be discovered by others.

These findings are supported by an audit of IFMIS in Kenya done by the auditor general who observed that the digital system is far from being the silver bullet against graft as envisaged by IT experts and government officials. An audit on the IFMIS, found it marred with a number of loopholes making it prone to abuse, exposing the taxpayers to immense risk of losing substantial resources. It emerged that several unidentified users were capable of logging into the system remotely while others had multiple identities in the government's main financial nerve centre. Auditor-General Edward Ouko wrote in the audit released in early 2017, IFMIS, was also found to be running on a poor network architecture badly affecting its uptime and causing financial inconveniences especially in counties where network downtime ranges anywhere between two and four days continuously (Business Daily, 2019).

Skill-based human error consists of slips and lapses: small mistakes that occur when performing familiar tasks and activities. In these scenarios, the end-user knows what the correct cause of action is due to a temporary lapse, mistake, or negligence. These might happen because the employee is tired, not paying attention, is distracted, or otherwise has a brief lapse of memory (Iddriss, 2014). In support of this argument, Iddriss (2014) considers inconsistency in privacy settings as a skill based error. He further indicates that one of the actions that can compromise security is by connecting office devices to public networks. When a device is compromised, an attacker can access its sensitive information and the device can be used as a new entry point to the corporate network. Further, Iddris (2014) argues that the second mistake was system administrators moving critical data to their personal computers at home due to pending assignments, which could be compromised to attackers. These behaviours can render all of the security measures in an institution a very hopeless process.

Decision-based errors occur when a user makes a faulty decision. A number of different factors include decision-based error. For example, user not having the necessary level of knowledge, not having enough information about the specific circumstance, or even not realizing that they are making a decision through their inaction. Amin (2014) for instance outlines some mistakes system administrators make that can put data at risk, which include the lack of a well-established personal security policy. He asserts that quite a number of system administrators do not follow established standards on personal security like network security, arbitrary system's software updates, and chaotic application of new patches. He states that the well-established companies fall short of this especially on their reluctance to patch their systems whenever new bugs are discovered.

2.3.3 Impact of IFMIS Risk Controls in Enhancing Good Governance in County Governments in Kenya

According to Ogutu (2014), implementation of IFMIS improves business operating efficiency through process reengineering, driving costs down to create a competitive advantage. For the county governments who are not in profit making agenda, the major reasons for implementing ERP systems is more of efficient and prudent allocation and utilization of resources, transparency, and efficient service delivery to the citizens.

Goonetilleke (2012) carried out a study on the identification of best practices for software application and outsourcing success in public sector organizations in Sri Lanka. The study identified key issues in application software life cycle such as success, failure factors, and software outsourcing to design. The model was tested by identifying the relationship between success and prevention of failure factors with outsourcing success. This research dwelt majorly on issues pertaining to installation and implementation of the systems that create gaps on the issue of technological risks that have not been looked at fully as well as technological risks countermeasures.

Goonetilleke (2012) study discussed above contradicts Wanyama (2011) study which points out that, in particular, IFMIS is supposed to face out the issue of many fiscal systems in the government that autonomously operated within specific structures, but create conflicting cultures among ministries. The objectives were to facilitate efficient and effective execution of all financial management processes, enhance security of fiscal records and help eliminate risks through controls by automation and integration of all fiscal systems. This was to allow the Government of Kenya to realize the full benefits of a financial management information system aimed at providing a structured framework for automated planning and budgeting processes.

Access control is a security technique that regulates who or what can view or use resources in a computing environment. It is a fundamental concept in security that minimizes risk to the business or organization (Gonzalez & Sawicka, 2018). Szilagyi (2018) explains that there are two types of access control: physical and logical. Physical access control limits access to campuses, buildings, rooms, and physical IT assets. Logical access control limits connections to computer networks, system files, and data. Access control systems perform identification authentication and authorization of users and entities by evaluating required login credentials that can include passwords, personal identification numbers (PINs), biometric scans, security tokens, or other authentication factors. Multifactor authentication, which requires two or more authentication factors, is often an important part of layered defence to protect access control systems (Backhouse, 2018)

Logical access controls are the features of a system that enable authorized personnel access to resources (Taylor, 2006). According to Collins (2013), logical access control tools are used for credentials, validation, authorization, and accountability in an

infrastructure and the systems within. These components enforce access control measures for systems, applications, processes, and information. This type of access control can also be embedded inside an application, operating system, database, or infrastructure administrative system. A benefit of having logical access controlled centrally in a system allows for a user's physical access permissions to be instantaneously revoked or amended (Collins, 2013). According to Torkzadeh (2018), security controls work by identifying an individual or entity, verifying that the person or application is who or what it claims to be, and authorizing the access level and set of actions associated with the username or IP address.

Robinson (2007) points out that there is still under utilization of data analysis in Ireland to detect financial statement fraud as compared to its perceived effectiveness. The study revealed business would benefit from implementation of data auditing to detect financial statement fraud. Introduction of audit trails and antifraud controls ensure all transactions performed on the system can be traced to the performer. According to Westhausen (2017), the utilization of audit technology in internal audit has provided adequate knowledge of key areas of fiscal information risks and controls while performing assigned audit functions in both public and private sectors. Therefore, by implementation, IFMIS can be used to perform audit functions in the government institution's whereby data mined from IFMIS systems would be used as source of information while conducting audit functions.

The security of data transmission is a vital problem in communication networks today. A communication system is reliable as long as it provides high level of security. According to Saraireh (2013), users exchange personal sensitive information or important documents and therefore, security, integrity, authenticity and confidentiality of the exchanged data should be provided over the transmission medium. In computer science, secure transmission refers to the transfer of data such as confidential or proprietary information over a secure channel (Sacca, 2018). Many secure transmission methods require a type of encryption. The most common email encryption extensions are STARTTLS, whereby in order to open the encrypted file, an exchange of keys must be done. Magklaras (2015) explains that many infrastructures such as banks rely on secure transmission protocols to prevent a catastrophic breach of security. Secure transmissions are put in place to prevent attacks such as spoofing and general data loss. In any

information system, components of such systems are interconnected and interrelated for efficiency.

In today's technology the interconnection of both internal and external access to an organization such as the case of distributed systems. Because of high levels of interconnectivity and big number of distributed systems within and without an organization is vulnerable to security breach (Orgil, 2017). Dhilon (2018) explains that, there are numerous ways to exchange data securely over a network, but each has its drawbacks. E-mail services use public and private encryption keys, but this requires each party to generate keys in advance. E-mail can also leverage special encryption hardware, but both parties must possess the hardware, which can become costly. Data can be secured with a password, but both parties must hold the password, and transmitting the password is a security issue in itself.

To avoid transmitting a password, a long-term password may be chosen, but this allows time for it to become compromised. With no full solution to the security issues in data transmission, a new method of encrypting and decrypting sensitive data is required. Further security measures may be employed such as creating time limits on data input or for the receiver's acceptance of the data. With the use of many steps, this method minimizes the risk of data leaks (Backhouse, 2018).

Data transmission threats come in many different forms. The threats are obvious when there is no security at all. When data in motion is unsecure, an eavesdropper could, at a minimum, intercept, read, manipulate, and impersonate the data stream. Indirect threats are usually available to an eavesdropper, even when the data is thought to be secure. For example, encryption helps to secure data by making at least part of the stream unreadable to the eavesdropper. However, if the source and destination addresses are clear, end users might be identifiable. If the transmission is not secured properly, packet replay could occur, resulting in potential database corruption and other forms of malice. Even the mere structure and size of encrypted packets can give away useful clues to a sophisticated listener. These are all examples of indirect threats that must be accounted for when securing data in motion (Eloff, 2018)

To begin with, encryption can secure data but does not necessarily secure the transmission of the data. Szilagyi, (2018) emphasizes data security and transmission

security should be thought of almost as two exclusively separate topics that work together to solve the holistic problem of secure data transmission. Since encryption provides the security of the data, a best practices encryption approach should be applied. Implementing the secure encryption baseline outlined provides the means necessary to secure all data types from attacks as they move between physical and logical networks (Orgil, 2017).

Information Security Policy (ISP) is a set of rules enacted by an organization to ensure that all users or networks of the IT structure within the organization's domain abide by the prescriptions regarding the security of data stored digitally within the boundaries the organization stretches its authority (Hovav 2018). Embretson & Hershberger (2009) point out that the main aim of the IT security policy is to come up with a framework that can be used to implement security and come up with control measures. The computerized information provided by the systems is key behind IFMIS operations and therefore the infrastructure, which supports it, must be protected from the risk. This is by ensuring that the system is corrupt free, no unauthorized access, system confidentiality maintained, which might otherwise get compromised either deliberately or accidentally.

One increasingly important mechanism for reducing the occurrence of security breaches, and in so doing, protecting corporate information, is through the formulation and application of a formal information security policy (Doherty et al., 2009). According to Alqahtani, (2017) organization information and data must be protected from active and passive attacks and secured from illegal access, unwanted interruption, unauthorized alteration or annihilation. Many organizations fall victim to such attacks due to weak information security policies (ISPs).

In addition, disruption of these IS policies by IT users exposes organizations to information security threats. As Parker, (2018) explains, information security is deemed to safeguard three main objectives; confidentiality – data and information assets must be confined to people authorized to access and not be disclosed to others; integrity – keeping the data intact, complete and accurate, and IT systems operational; availability – an objective indicating that information or system is at disposal of authorized users when needed. According to Bartel (2009), IFMIS security, its information security policies have been compromised a lot. This can be mitigated by managing user privileges, and limiting the number of privileged accounts on IFMIS. This includes super admins who can

monitor all the transactions on the system, admin users of the system and lastly public who are outside users. The public can only transact but cannot alter transactions.

2.4 Research Gap

Many studies on IFMIS have majorly dwelt on IFMIS implementation, challenges in implementation and benefits of IFMIS implementation but little has been explored on the pitfalls of the same system. For instance, Omokonga (2014), Kahianyu (2013), Odoyo et al. (2014) all had their studies pivoted on the implementation and effects as discussed in the empirical review. On the other hand, Uganda Ministry of Finance (2015), Kimwele (2011) had their research on perceived benefits of IFMIS as captured in the empirical review. Yet in all these and many more, little has been done to examine the accountability and transparency aspects. For this reason, this research intends to bridge this gap by looking at the specific objectives regarding:

Table 2.1 Summary of Research Gaps

Researcher	Study	Recommendation	Study Findings	Research Gap
Omokonga (2014)	Effects of integrated financial management information system on the performance of public sector organizations.	The consider prescribed that the Ministry of Finance ought to both request to and back the appropriation of the framework inside the county government framework.	There was a positive relationship between IFMIS and progressed money related reporting.	This study analysed public sector as a whole, which might differ separately. This study will look at the effectiveness of IFMIS in the delivery of financial services in all county governments in Kenya.

Kahianyu (2013)	Effects of IFMIS on public finance management and service delivery of government ministries in Kenya.	The study recommended that more training should be done to improve usage of IFMIS to improve on accountability.	Study indicated that IFMIS has not only enhanced accountability, efficient allocation of resources and encouraged more transparency but has also led to improved public financial management and ultimately service delivery.	The study analysed effects of IFMIS on PFM in government ministries. This was done when devolution was not in place and this study will therefore analyse its impact on county PFM on service delivery.
Odoyoetal. (2014)	The effect of IFMIS on cash management practices in Eldoret West District Treasury.	The study recommended the administration ought to guarantee that data generated by IFMIS is consistent, timely, and adequate.	The reliability of IFMIS and its flexibility positively affect cash administration. Discoveries too uncovered the usage of IFMIS has not been a victory as a result of the top down management displayed in	The study analysed the effect of IFMIS on cash management only, and also the scope of the study was in Eldoret West District. This study establish the relevance of IFMIS risk countermeasure in relationship to accountability

			most of the public segment	and transparency in PFM in county governments in Kenya
Ugandan Ministry of Finance (2015)	The effectiveness of the integrated financial management system in Uganda.	The study recommended that MFPED and National Information Technology Authority (NITAU) should fast track the national transmission backbone infrastructure (NBI) project to reinforce the network connectivity of the expanding number of clients on the IFMS	The study indicated that the expected outcomes have not been fully achieved in the country because of the de-incentivised human assets. Many institutions were also using frameworks that were not interfacing with the IFMS	The study analysed the effectiveness if IFMIS in Uganda and the data analysis tool different. This study will look at the security risks on PFM accountability and transparency among county governments in Kenya.
Kimwele (2011)	Factors influencing the use of integrated financial management information systems in public sector in selected Kenyan ministries.	The Ponder suggested that government employs an alter operator to supervise the execution of the IFMIS framework and those clients of the framework to experience on job training in order to	The framework is influenced generally by disrupt and resistance. The Ponder moreover setup that administration bolster is missing and best	The Ponder analysed the ministries in Kenya and used a different data analysis tools. This study will establish the relevance of IFMIS risk countermeasure in relationship to

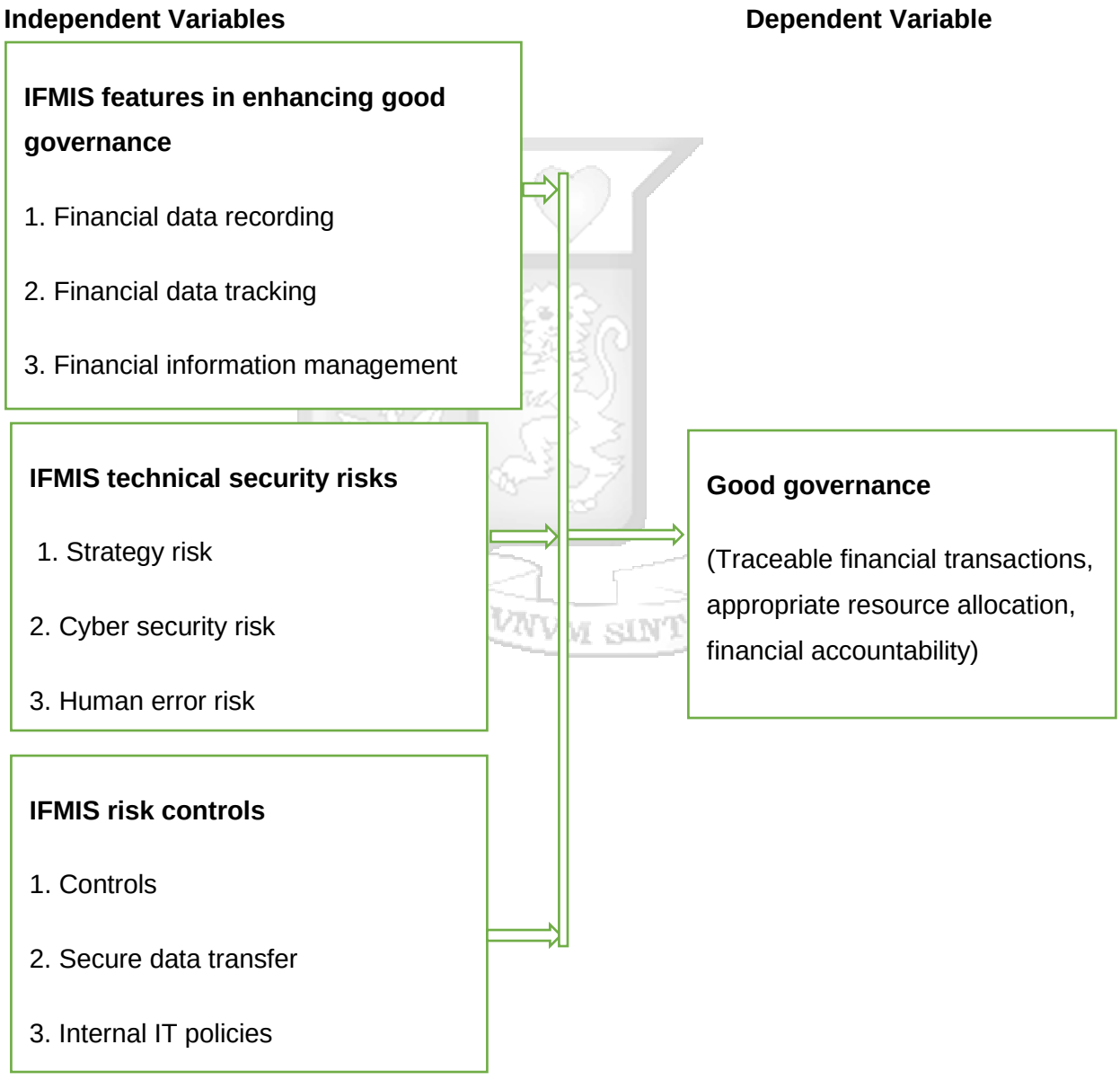
		move forward their capabilities and skills to utilize the framework.	administration does not motivate the client. The specialized and capacity skill was found to be low due to lack of training and the rushed usage of the of the framework	accountability and transparency in PFM in county governments in Kenya

Source (Literature review, 2021)

2.5 Conceptual Framework

The study is focused on the effectiveness of IFMIS in enhancing accountability and transparency. Independent variable is effectiveness of IFMIS in PFM, technological security risks and Technological security risk mitigation while the dependent variable is IFMIS accountability and transparency.

Fig 2.1 Conceptual framework



2.6 Operationalization Of Variables

The table below shows the Operationalization of variables. It outlines the indicators to the variables, the measurement scale and type of analysis to be conducted under each variable.

Table 2.1 Operationalization of Variables

Variable	Measurement	Research
Effect of IFMIS features in relation to good governance	(1-4) Likert chart Level of agreement to reflect how IFMIS has enhanced accountability and transparency in financial management	Njonde (2014) - Effectiveness of IFMIS on performance of public sector in Kenya
IFMIS technical security risks in relation to good governance	Likert scale of 4 point blended with closed ended questions to reflect technology risks associated with use of IFMIS that can compromise service delivery	Hendrisks (2012) IFMIS – Effective implementation in South Africa
IFMIS security risks controls in relation to good governance	Likert scale (1-4) point to reflect extends of agreement risk countermeasures to promote IFMIS transparency and accountability.	Chene (2009) – The implementation of IFMIS
Good governance (Transparency and accountability in IFMIS accounting operations)	Likert scale (1-4) point to reflect extends of agreement	Chene (2009) - The implementation of IFMIS.

2.7 Chapter Summary

Various scholars have highlighted incorporation of IFMIS in financial management performance reforms in length. There studies show that one cannot talk of financial reforms without mentioning IFMIS. Many nations, governments, and institutions have adopted IFMIS as an acceptable financial system. Even though there have been reports of success of the system in financial management with benefits accrued to it as shown in the past researches in developed nations, in Kenya, despite its adoption, corruption and incomplete projects tend to be the order of the day. This is influenced by a number of factors but more so, lack of willingness to adopt the system fully or technological challenges that come with it that create loopholes hence compromising efficiency and effectiveness of the system. It is for this reason that the study aims to contribute to the extant literature by discovering and highlighting the benefits of fully adopting the system and the role the system is playing to ensure public sector financial management efficiency and accountability.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives a detailed methodology of the study. For instance, section 3.1 introduces the chapter, section 3.2 provides an overview of the selected research design, while section 3.3 provides information on population and sampling. Section 3.4 looks at data collection models and instruments supported by section 3.5 that looks at data analysis, and finally section 3.6 highlights the ethical considerations to be observed to ensure the research meets ethical and academic standards.

3.2 Research Philosophy

Creswell (2012) defines research philosophy as the underlying belief held by the researcher on the way data for a particular study should be collected, analysed, and applied. On the contrary, Owino (2014) refers to research philosophy as to the degree of how knowledge about a reality is established together with the constructs of that knowledge. Going by the two opinions Creswell (2012) and Owino (2010), Babbie sums up the idea on research philosophy in that research philosophy helps provide an explanation for the assumptions that people make about nature of reality and it defines the orientation of the person doing the research.

This research adopted positivism research philosophy. Positivism is an empirical, quantitative approach in which hypothesis testing is used to discover facts generalizable to the population in which there is an assumption that for each event, there is a cause that determines its outcome (Williams, 2013). The study adopted a positivism research philosophy because this method provided the researcher with the opportunity to use the quantitative method subjectively due to the number of respondents expected to take part in the study (235) and data collection (questionnaire) and analysis (SPSS) methods as highlighted in the research design. The nature of question this study sought to investigate fits wholly in the positivism approach since the study works on assumption that for each event, there is a cause that determines its outcome. In this case, the outcome being transparency and accountability influenced by actions taken by users of the system. As such, the study considered the positivism paradigm as the most appropriate approach to establish the nature of relationships between the independent and dependent variables empirically through data collection and analysis.

3.3 Research Design

Research design is the organisation, planning, analysis and collection of data with the aim of providing adequate responses to the research questions which means that the choice of research design emanates from the key study objectives and questions (Creswell, 2009). The study adopted a descriptive cross-sectional research design. The study was cross-sectional and quantitative in nature aimed at evaluating the variables within the objectives to generate the correct inferences. A descriptive approach adopted, which, in essence, examined the existing condition to determine facts without any influence on the sample population. The descriptive approach was preferred because it looks at the "what and how" rather than the "why". In this case, the descriptive research sought to reveal the relationship between IFMIS features i.e. effectiveness of IFMIS in PFM, IFMIS security risks in PFM and IFMIS security risks controls in relation to good governance in county governments. The researcher adopted this methodology since it seeks to gather more knowledge to an existing problem (misappropriation of resources) to inform good governance in county governments

3.4 Population and Sampling

The target population of the study comprised of all employees under Finance and Economic planning in each county because these are the officers tasked at county level with implementing budgeting process, revenue collection, finance reporting, drawing and implementing procurement plans using IFMIS platform. The table below shows departments interfacing with IFMIS from all the 47 county governments' thus a total population of 235.

Table 3.1 Target Population and Size per County

Cadre	**Target population/county**	**Sample size/county**
County executive	**1*47**	**1*47**
County Finance Minister	**1*47**	**1*47**
CFO (Administration)	**1*47**	**1*47**
CFO (Planning)	**1*47**	**1*47**
CFO (Human Resource)	**1*47**	**1*47**
Total	**235**	**235**

Source: Author (2021)

3.4.1 Sampling

A sample is a part of a whole thing (population) which the researcher has decided to use to collect data (Tromp & Kombo, 2006). The researcher adopted purposive sampling design to sample the desired categories of the respondents as shown in table 3.1 from each county governments due to their ability to provide required information for the study. This technique enabled the researcher to select respondent whom the researcher deemed crucial to take part in the study.

3.5 Data Collection Methods

Data collection involves consulting primary and secondary data sources in order to elicit information, facts, evidence, proofs or some truth regarding the research problem (Babbie, 2002). It also involves operationalizing the research design into instruments of data collections with a view of collecting data to meet the research objectives (Chandaran, 2004). The study used primary data, hence the use of a questionnaire to collect data. This was informed by the fact that questionnaires are simple to administer, inexpensive and easy to analyse (Kothari, 2017).

The questionnaires were administered through emails, and drop-and-pick where necessary. The questionnaire was divided into 2 sections. The first section comprised of questions pertaining to respondents' background information. The second section entailed questions pertaining to study objectives with specific questions on effect of IFMIS features, technological risks associated with use of IFMIS and lastly the technological risk controls in relation to good governance.

3.5.1 Pilot Study

A pilot study is a small-scale research project that collects data from respondents similar to those used in the full study (Zikmund et al., 2009). Pre-testing the instrumentation and the entire research design permits refinement before the commencement of the study. In particular, pilot testing helps the researcher to identify any weaknesses in the study design as well as in the research instruments to be used and hence opportunity to rectify them at an early stage. A pilot test was done to ensure the questionnaire's consistence and clarity before the actual study.

The feedback from the pilot study was used to improve the quality of instrumentation that was subsequently used during data collection and analysis. This entailed reducing number of questions to make the questionnaire focused to point of interest as well as including introduction letter to build confidence on the respondents to take part in the study and ensure optimum response rate.

3.5.2 Validity and Reliability

The validity of a research instrument refers to its ability to measure what it is intended to measure (Brayman, 2015). Reliability is how well the study can be replicated, how stable and consistent the information in the questionnaire is (Barbara & Clarke, 1998). In this study, Cronbach's alpha was used to measure the reliability of the information given in the questionnaire (Cronbach, 1951).

In this study, the questionnaire was tested on 10% of the sample as recommended by Kothari (2017) who states that 5% to 10% of the sample can be adequate for running reliability tests. The pilot was done on 10 randomly selected respondents (human resource officer at Nairobi County who use IFMIS) who did not take part in the final study to test the reliability of the instruments. SPSS was used to test Cronbach reliability from the 10 questionnaires feedback. Internal consistency reliability is said to be high if the Cronbach's alpha coefficient is closer to 1. According Cronbach (2013) coefficient above 0.7 is recommended for general studies.

Table 3.2 Reliability Test

Variable	Cronbach Alpha	Comments
Effect of IFMIS features	0.874	Acceptable
IFMIS security risks	0.925	Acceptable
IFMIS security risks controls	0.958	Acceptable

Source: Author (2021)

3.6 Data Analysis

Data analysis is the practice in which raw data is filtered and organized so that useful information can be extracted from it (Saunders, 2008). The primary data obtained from the questionnaire was checked for omissions, legibility, and consistency before being coded for analysis. Data was analysed using SPSS (Statistical Package for Social Sciences), which was employed in organizing, coding and analysis of information to produce quantitative report. The data was subjected to simple and multiple regression models to test the relationship between the independent variable.

3.6.1 Statistical Tests

Statistical techniques including, Correlation Analysis and ANOVA were used. Statistical Package for Social Sciences (SPSS) was used to facilitate analysis. SPSS was used to generate tabulated reports, charts, compare means and correlation. Correlation tests measures the extent of interdependence where two variables are linearly related (Lucy, 1996). If variables are correlated, then a change in one variable is accompanied by a proportionate change in another variable. Correlation coefficient (r) is a measure of correlation between two variables.

If variables are not correlated, r = 0, if correlated, then r = 1. If the value of r is close to one, then it shows there is a strong correlation between the variables. If the value of r is close to zero, then the correlation is weak. Analysis of Variance (ANOVA) is a statistical technique specially designed to test whether the means of more than two quantitative populations are equal (Levin & Rubin, 1994). With the help of the SPSS software results for the above statistical tests were computed and displayed using tables.

3.6.2 Regression Models

Quantitative data was subjected to measures of dispersion and symmetry using inferential statistics. In order to show the relationship between the independent and dependent variables, the multilinear regression method was adopted with the aim of drawing inference into the effect of each of the independent variables on the dependent variable (service delivery).

Where:

Y = dependent variable (Good governance in county governments)

{β i; i=1,2,3} = The coefficients for the various independent variables

Xi = various independent variables specifically: -

Y = Good governance (Transparency and accountability)

X_1 = Effect of IFMIS features in relation to good governance

X_2 = IFMIS technological risks in relation to good governance

X_3 = IFMIS technological risks controls in relation to good governance

To test the significance of the model, F-test was used at 95% (0.05) confidence interval. The p-values for the F-statistic was calculated and used to test the level of significance.

3.6.3 Summary of Models

Table 3.2 Summary of Models

Objective	Research question	Test equation	Interpretation
To establish effect of IFMIS features in enhancing good governance in county governments in Kenya	To what extent is IFMIS features effective in enhancing good governance in county governments in Kenya?	$Y = \beta_0 + \beta_1 X1 + e$	Positive coefficient B1= IFMIS features effective in enhancing good governance
To establish security risks in use of IFMIS towards good governance in county governments in Kenya.	What are the security risks associated with use of IFMIS in public financial management towards good governance?	$Y = \beta_0 + \beta_2 X2 + e$	A positive co-efficient B3= security risks affecting IFMIS in PFM
To establish IFMIS security risk controls in relation to good governance	What is the impact of IFMIS security risk controls in relation to good governance in county governments in Kenya?	$Y = \beta_0 + \beta_3 X3 + e$	A positive coefficient B3= effective IFMIS security risk controls

Source: Author (2021)

3.7 Ethical Consideration

The research was guided by following ethical considerations. Ethical Clearance was obtained from Strathmore University Ethics Review Committee and a research permit sought from the National Commission for Science, Technology, and Innovation (NACOSTI). An introduction letter to the respondents on the researcher and the kind of research being undertaken was obtained from Strathmore Business School. Participants were assured of their privacy on data and information provided. The research was on voluntarily basis and data obtained treated confidential and only used for the intended sole purpose of this research

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.0 Introduction

This chapter highlights the results of data analysis and presentation of the findings. Section 4.1 summarizes study response rate. Section 4.2 analyses and presents data on demographic characteristics while section 4.3 outlines the reliability test for the study. Section 4.4 summarizes the results obtained from the questionnaire using descriptive statistics such as frequency of respondents, percentage, and mean. Section 4.5 presents the relationship between the independent and dependent variable outlined in Chapter 2 and the varying levels of impact in form of multiple regression equation and lastly section 4.6 gives a summary of the research.

4.1 Response Rate

The researcher administered 235 questionnaires to the respondents as captured in the table below. Out of the 235 distributed questionnaires, 174 questionnaires were filled and returned (a response rate of 74.04%), which was considered sufficient for the research. Babbie (2005) observes that response rate above 50% is sufficient and reliable for conducting data analysis.

Table 4.1 Questionnaire Response Rate

Response	**Frequency**	**Percentage**
Responded	174	74.04%
Not responded	61	25.96%
Total	**235**	**100**

Source: Field Data, 2021

4.2 Demographic Characteristics

This section presents demographic information of the respondents concerning their age, duration worked in the organization, highest level of education, department and the position of the respondents

Table 4.2 Demographic Characteristics

Demographic characteristic	**Frequency**	**Percentage %**
Age Distribution		
18-24	24	14%
25-35	37	21%
36-44	66	38%
45-52	30	17%
53-60	17	10%
Total	**174**	**100%**
Level of education		
Diploma	32	18%
Undergraduate Degree	111	64%
Master's Degree	24	14%
Doctorate degree	7	4%
Total	**174**	**100%**
Number of years worked		
1-3	52	30%
4-7	101	58%
8 years and Abo	21	12%
Total	**174**	**100%**
Distribution by Position		
County executives	35	20.11
Finance officers	62	35.63
Accountants	77	44.25
Total	**174**	**100**

Source: Author/Researcher (2021)

On age distribution, data shows a large proportion (38%) of the target population were 36-44 years of age while those in the age bracket of 25-35 years were 21%. On the other hand, 17% were between the ages of 45-52 while 10% were in the age bracket of 53-60 years. Additionally, 14% of respondents represented 18-26 years of age bracket. Results

show that the target workforce comprises of relatively young individuals conclusively 27-44.

The respondents were also asked to indicate their level of education. This was important, as it would help the researcher link the results with a question on level of accuracy during data input in the system. Out of the 174 responses received. 32 respondents indicated to have diploma certificates only, which translates to 18%. A huge number, 111 respondents, indicated they had undergraduate certificates translating to 64%. Master's Degree holders were 24, which translates to 14%, and finally only 7 respondents indicated to be having a Doctorate (PhD) putting it at 4%.

From the findings, it is clear that a huge number of finance staffs in respective county governments have attained at least undergraduate certificate, which make them qualified to work in their respective departments. This might be associated with the youthful age identified by the study of age (27-44) years who form the bulk of the employees in the respective departments. These findings are important as they help unravel effectiveness of IFMIS in promoting accountability and transparency as partially human productivity is a relative of level of education among the employed taskforce.

On the question of number of years worked in the county, study findings indicate that, majority of the respondents at 58% have worked on the county governments between 4-6 years. This is followed closely by 30% response of respondents who have worked between 1-3 years. 21 out of the 174 representing 12% have worked for over 8years in the respective county governments. The huge percentage of 58 percent of 4-6 years can be attributed to either those respondents who were retained after the new term of county governments took over due to their expertise or also it can be deduced that they came in with the new county administrators who took over after elections thereby serving either their 4th year. The 30% response on 1-3 years can be deduced to county governments hiring new blood into their financial dockets or hiring of new expertise due to change in technology.

Generally, the above implications can be linked to the respondents who are employed between the ages of (27-44) years. Finally, the study indicates 12% have served for more than 8 years. This leads to the conclusion that the respondents have served in their respective dockets since inception of county governments, and therefore retained due to

either experience, or expertise with the system. In summary, a huge number are familiar with the system as indicated by the number of years they have interacted with the system.

4.3 Data Analysis

Data analysis took place at two levels – descriptive statistics level and inferential statistics level. Descriptive analysis aims at summarizing distributions and describing a set of data on factors of the study. This analysis was thus used to profile respondents. It was carried out by producing frequency distributions, mean scores, standard deviations and coefficients of variation and these results were displayed in tables as discussed below.

4.3.1 Descriptive Analysis

This section entails the descriptive results of variables in the study. Tabulation was conducted and presentation done in form of frequencies.

4.3.1.1 Objective One: To Establish Effect of IFMIS Features in Relation to Good Governance County Governments in Kenya.

Table 4.3 Response on Effect of IFMIS Features in Relation to Good Governance (Transparency and Accountability)

Statement	N	Mean Score	Standard deviation	Coefficient Variation (%)
IFMIS seeks to ensure financial data security and validity through audit trails	174	3.3103	1.4880	44.9489
IFMIS seeks to provide storage of financial information through data back-ups	174	3.2069	1.1561	36.0496
IFMIS seeks to ensure enhanced level of accountability in financial transactions due to its provision of authorizations and approvals	174	3.1379	1.3576	43.2638

IFMIS seeks to enable real time financial transactions capture thus minimizing on fraud related to data alteration	174	3.9310	1.2298	31.2852
IFMIS seek to provide automated reports on cash and projects ensuring transparency	174	3.6724	1.2232	33.3069
Total average	**174**	**3.4517**	**1.2909**	**37.7709**

Source (Author,2021)

The overall mean for Effectiveness of IFMIS on PFM was 4.4517, standard deviation of 1.2909 and coefficient of variation of 37.7709%. This is a relatively moderate agreement on the aspect of Effectiveness of IFMIS on PFM towards accountability and transparency in PFM according the respondents who took part in the study in the counties.

The statements with the highest mean IFMIS seek to enable real time financial transactions capture thus minimizing on fraud related to data alteration, and IFMIS seek to provide automated reports on cash and projects ensuring (Mean=3.9310 SD=1.2298, Coefficient=31.2852) and (Mean= 3.6724, SD=1.2232, Coefficient=33.3.69) respectively with the statement IFMIS seek to ensures financial data security and validity through audit trails , IFMIS seek to provide storage of financial information through data backups and IFMIS seek to ensure enhanced level of accountability in financial transactions due to its provision of authorizations and approvals having the lowest means (Mean=3.3103, SD=1.4880, Coefficient=44.9489, Mean=3.2069, SD=1.1561, Coefficient=36.0496, and Mean=3.1379, SD=1.2576, Coefficient=43.2638).

The moderate coefficients of variation (31% to 44%) depicts that respondents were less varied among the attributes of effectiveness of IFMIS in PFM towards accountability and transparency in PFM. This moderate response might be attributed to the fact that IFMSI as a system is part of a large PFM system that encompasses humans and systems thus their accuracy in the report generation and transaction capture is equivalent to the accuracy and transparency of the person using the system.

4.3.1.2 Objective 2: To Establish Security Risks in Use of IFMIS in Relation to Good Governance in County Governments In Kenya

Results from 2nd objective found out that password sharing is a major threat to IFMIS usage (M=3.8506, SD=1.1845, Coefficient=30.7608). This was followed closely by study findings that indicated use of unsecured access points exposes IFMIS to hacking (M=3.6782, SD=1.3261, Coefficient=38.9376). Results also indicated IFMIS suffers data integrity due to errors during data input (Mean=3.3621, SD=1.4146, Coefficient=42.0752). Malicious data alteration poses were also discovered to pose a threat to IFMIS accountability and Transparency in PFM (Mean=3.2759, SD=1.4754, Coefficient=45.0382). IFMIS hacking was also found to pose a threat in IFMIS PFM (Mean=3.0805, SD=1.1668, Coefficient=37.8764). The overall mean score for IFMIS security risks on PFM according to respondents was 3.4494, standard deviation of 1.3135 and coefficient of variation of 38.9376%. This finding seems to suggest that respondents neither agree nor disagree that technical security risks in IFMIS use in PFM has effect on accountability and transparency in PFM in county governments implying that technical risks only account up to 38.9376 variation in accountability while the rest of factors not associated with IFMIS account for up to 61.07% variation.

Table 4.4 Response on IFMIS Security Risks

Statement	**N**	**Mean Score**	**SD**	**Coefficient Variation %**
Malicious data alteration poses a major threat to IFMIS	174	3.2759	1.4754	45.0382
IFMIS hacking aimed at denying county of financial services poses security risk	174	3.0805	1.1668	37.8764
IFMIS suffers data integrity due to data input errors	174	3.3621	1.4146	42.0752
Password sharing is a major threat to IFMIS usage	174	3.8506	1.1845	30.7608
Use of unsecured access points exposes IFMIS to hacking	174	3.6782	1.3261	38.9376
Total average	**174**	**3.4494**	**1.3135**	**38.9376**

Source (Author) 2021

4.3.1.3 Objective 3: To Establish The IFMIS security Risk Controls In Relation To Good Governance In County Governments In Kenya

Table 4.5 Response IFMIS security risk controls

Statement	N	Mean score	SD	Coefficient Variation %
Continuous data back-up on secure servers ensures financial information is readily available	174	3.2989	1.4865	45.0597
Restricting access to IFMIS domain by use of firewalls and VPNs has enhanced security of PFM information on IFMIS	174	3.1437	1.3276	42.2312
Secure data transmission through use of data encryption unsure safety of data on transit	174	3.1379	1.4398	45.8827
Use of passwords and authorized personnel only to restricts access to registered users	174	3.4770	1.2068	43.0278
Continuous staff training increases staff security awareness	174	3.6552	1.2939	35.3994
Total average	**174**	**3.3425**	**1.3509**	**42.3202**

Source (Author 2021)

The overall mean score effect of IFMIS risk controls in PFM as a construct of good governance (accountability and transparency in PFM) in county governments in Kenya was 3.3425, standard deviation of 1.3509 and coefficient of variation of 42.3202%. This depicts that respondents moderately agreed that security risks controls on IFMIS use in PFM has a moderate effect on good governance (accountability and transparency in PFM). The statement with the highest mean score was that continuous staff training increases staff security awareness (Mean=3.6552, standard deviation=1.2939 and coefficient of variation 35.3994).

This depicts the role staff training on IFMIS has on overall net effect as much as IFMIS use in PFM is concerned. Staff trainings will include data entry, which is related to data breach issues, proper decision making as far as integrity is concerned as well as IFMIS module use to maximize its potential to avoid overlapping systems is concerned. Use of passwords and authorized personnel only to restrict access to registered users had a mean score of 3.4770, SD 1.2068 and coefficient variation of 43.0278. This came second thus showing that if password sharing can be restricted, then there will be integrity of the data in the system as passwords in the hands of wrong users brings about data breach as well as information theft.

Respondents also agreed that the issue of continuous data back up on secure servers will ensure financial information is readily available (Mean=3.2989, SD=1.4865, Coefficient=45.0597). This signifies the extent; which county governments have gone to ensure data is always available for future use.

Consequently, respondents also agreed that restricting access to IFMIS domain by use of firewalls and VPNs has enhanced security of PFM information on IFMIS (Mean=3.1437, SD=1.3276, Coefficient=42.2312). This ensures staff working from home can easily access the system via secure networks and that firewalls have been put in place to ensure no unauthorized person can gain access to the system without approval.

Lastly, respondents in the counties were also in agreement that secure data transmission through use of data encryption unsure safety of data on transit has a net effect on accountability and transparency in PFM (Mean=3.1379, SD=1.4398, Coefficient=45.8827). Secure data transmission entails encryption of data and using authorized channels.

4.3.2 Regression Analysis

Prior to carrying out multiple linear regression analysis, it is advisable to conduct diagnostic tests to ascertain whether the data is fit for study.

4.3.2.1 Factor Analysis Test

Prior to conducting diagnostic tests, factor analysis was done to identify factors, which may not be instrumental to the study. Factor analysis is a dimension reduction method that acts as a gauge of the substantive importance of a given variable to the factor and it was used to identify and remove hidden constructs or variable items that do not meet the

objectives of the study and which may not be apparent from direct analysis (David et al., 2010). Communalities and eigenvalues was used to show the substantive importance of variable factors. In this study eigenvalues for each variable were extracted using principal component analysis. The components with eigenvalues of 1 and 53 above were used for further analysis. These were combined by addition to come up with a composite variable with maximum variation to be used in regression analysis.

4.3.2.2 Normality Test

Normality test is central to statistics especially when parametric tests such as correlation and regression analysis are to be used. Therefore, in this study normality tests were carried out and used to determine if the data is well modelled and normally distributed (Gujarati, 2002). The study applied Kolmogorov-Simonov normality test whereby in Kolmogorov-Simonov test, if the test of normality yields a figure of less than 0.05 it means that the data is not normally distributed. The Kolmogorov and Shapiro-Wilk test helps us conclude whether our data is not normally distributed or not.

Table 4.6 Shapiro-Wilk Tests of Normality

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Good governance (accountability and transparency)	.147	174	.000	.953	174	.000

a Lilliefors Significance Correction

Source (Research data 2021)

From the results, both the Kolmogorov-Simonov and Shapiro-Wilk tests yielded a p-value of more than the alpha value of 0.05. This implies that both tests passed the normality threshold therefore; the response variable is normally distributed.

4.3.2.3 Multicollinearity Test

Multicollinearity test was conducted to assess whether a high correlation existed between one or more variables in the study with one or more of the other independent variables. It is a situation that occurs when some independent variable correlated with others. When this association is high, this affects the prediction abilities of each predictor variable

(Mugenda & Mugenda, 2003). Multicollinearity is assumed to be absent when testing hypothesis using regression analysis but this has to be confirmed by the multicollinearity test. The test was thus computed using the Variance Inflation Factors (VIF) and its reciprocal, the tolerance, to establish if one predictor had a strong linear relationship with other predictors. A common variance inflation factor (VIF) rule of thumb is that VIFs of 10 or higher is a sign of severe or serious multi-collinearity that affects the study (O'Brien, 2007).

Table 4.7 Coefficients

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant) IFMIS features in relation to good governance	.975	1.026
	IFMIS Technical Security risks	.993	1.008
	IFMIS Security Risks Controls in relation to good governance	.980	1.021

a Dependent Variable: Good governance (Accountability and Transparency)

Source (Research data 2022)

In the current study tolerance ranged from 0.975 to 0.993 and therefore its reciprocal, the VIF was between one and two, which is below the maximum threshold value. This indicated that the data set displayed no multicollinearity.

4.3.2.4 Test of Homoscedasticity

Furthermore, homoscedasticity was tested to establish whether the variance of errors between the dependent and independent variables is the same across all levels of the independent variable. When homoscedasticity is absent, it leads to serious weakening of analysis and distortion of findings (Osborne & Waters, 2002). Regression analysis thus assumes homoscedasticity (variance of errors is the same), however the test for this assumption must be carried out. The Levene's test of homogeneity of variances was thus used in the current study and according to Gastwirth, Gel and Miao (2009) the Levene statistic is significant at $\alpha = 0.05$, which implies at p value greater than 0.05 there is homoscedasticity and hence regression analysis can be applied.

Table 4.8 Levene's Test Of Equality Of Error Variances

F	df1	df2	Sig.
1.168	145	28	.325

Dependent Variable: Good governance (Accountability and Transparency)

Source (Research data, 2022)

4.3.2.5 Test Of Independence

The Durbin-Watson co-efficient test was employed for testing independence of error terms,

Where if the statistic ranges from 1.5 to 2.5, it implies that the observations are independent

(Garson, 2012). Results on this test were as shown in Table 4.15.

Table 4.9 Test of independence

Variables Predictors: (Constants),a	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
IFMIS features	1	.641(a)	.411	.408	.45060	2.064
IFMIS Technical Security risks	1	.369(a)	.136	.131	.54585	1.966
IFMIS Security Risks Controls	1	.281(a)	.079	.074	.56347	1.966

a Predictors: (Constants), IFMIS features, IFMIS Technical Security risks, IFMIS Security Risks Controls

b Dependent Variable: Good governance (Accountability and Transparency)

Source (Research data, 2022)

As indicated through the Durbin-Watson test whose statistic ranges from 1.5 to 2.5, in the current study, the test results ranged between 1.865 and 2.072 supporting independence of Observations.

4.4 Inferential statistics

Inferential analysis was performed in order to establish the nature and magnitude of the relationships between the variables. Since the researcher's intention was to establish relationships between the study variables, correlation analysis tests - Pearson's Product Moment Correlation (PPMC) and Coefficient of determination (R2), which specifies the amount of variation in the dependent variable explained by the independent variable, were used to determine the association between the variables.

4.4.1 Correlation Analysis

Before conducting regression analysis, the researcher first established whether there were significant associations between the study variables Effectiveness of IFMIS in PFM, IFMIS Technical Security risks in PFM, IFMIS Security Risks Countermeasures and accountability and transparency. Pearson's product moment correlation (r) was used to measure this degree of association by assessing both the direction and strength. Pearson correlation coefficients range from -1 to +1, with negative values indicating negative association and positive values indicating positive correlation. Specifically, Pearson coefficient < 0.3 indicates weak correlation, Pearson coefficient >0.3<0.5 indicates moderate correlation, Pearson coefficient>0.5 indicates strong correlation, while Pearson coefficient =0 indicates that there is no relationship (Saunders, Lewis & Thornhill, 2016).

Table 4.10 Correlations Matrix

	IFMIS features	IFMIS Technical Security risks	IFMIS Security Risks Controls	Good governance
Pearson Correlation	1	.817(**)	.474(**)	.641(**)
Sig. (2-tailed)		.000	.000	.000
N	174	174	174	174
Pearson Correlation	.817(**)	1	.490(**)	.369(**)
Sig. (2-tailed)	.000		.000	.000
N	174	174	174	174
Pearson Correlation	.474(**)	.490(**)	1	.281(**)
Sig. (2-tailed)	.000	.000		.000
N	174	174	174	174
Pearson Correlation	.641(**)	.369(**)	.281(**)	1
Sig. (2-tailed)	.000	.000	.000	
N	174	174	174	174

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

Source (Research data, 2022)

The results in Table above show that IFMIS features has the strongest positive influence on good governance (accountability and transparency) in counties (r =.641 and P<0.05) and the relationship is statistically significant.

In addition, IFMIS technical security risks is positively correlated to good governance (r =.369 and P<0.05) with the association being statistically moderately significant. However, IFMIS Security Risks Controls and accountability and transparency is weak and statistically insignificant (r =.281 and P>0.05) implying that IFMIS Security Risks Countermeasures alone will not influence accountability and transparency in PFM in County governments. The results in the correlation matrix imply that effectiveness of IFMIS in PFM variable is a very crucial determinant of accountability and transparency in PFM, followed by IFMIS technical security risk and lastly IFMIS Security Risks Countermeasures though with weak relationship. Since the correlations between the predictor variables and Dependent variable were not very high (that is, r<0.07), the variables were suitable for further analysis using simple and multiple regression (Osborne and Waters, 2002).

4.4.2 Multiple Linear Regression Analysis

Regression analysis was conducted to determine the linear statistical relationship between the dependent and independent variables of the study. Regression analysis can also be used determine the strength of the relationship between the independent and dependent variables and to determine the combined effect of all the independent variables on the dependent variable (Cooper & Schindler, 2010). The coefficient of determination (R-square) was used to measure the change in dependent variable explained by the change in independent variable(s) while F –test was carried out to evaluate the significance of the overall model and to define the relationship between the dependent variable and independent variables.

4.4.3 Goodness of Fit

Goodness of fit of the model refers to how well the model explains the variations in the dependent variable (Gujarati, 2012). It evaluates whether the model is good, reliable and valid to be used for prediction. In this study, the R squared, Standard error of estimate (S.E.) and the F-test statistic were used respectively to evaluate the goodness, reliability and validity of the various models. In this study F-test was used further to determine the validity of the model while R squared was used as a measure of the model goodness of fit. The regression coefficient summary was then used to explain the nature of the relationship between the dependent and independent variables. Coefficient of Determination explains the extent to which the change in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable that is explained by all the independent variables. The coefficient usually lies between 0 and 1 whereby 0 indicates a complete lack of fit while 1 indicates a perfect fit. Therefore, the closer it is to 1 the better the fit.

Table 4.11 Model Summary

Model					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
1	.696(a)	.485	.475	.42402	1.966

From Table 4.11, the coefficient of determination (R-squared) of 0.485 shows that 48.5% variation in good governance (accountability and transparency), can be explained by IFMIS features, security risks in IFMIS use and IFMIS use security risks controls. The adjusted R of 0.475 indicates that the independent variables explained the variation in good governance by 47.5 %, while the remaining variation can be explained by other factors not included in the model. An R of 0.696 shows that there is a positive correlation between the dependent and independent variables.

Table 4.12 ANOVA

ANOVA(a)					
	Sum of Squares	df	Mean Square	F	Sig
Regression	28.736	3	9.579	53.277	000(a)
Residual	30.565	170	.180		
Total	59.301	173			

a. Dependent Variable: Good governance

b. Predictors: (Constant), IFMIS features, IFMIS security risks, IFMIS security risks controls

Source (Research data, 2022)

Analysis of Variance (ANOVA) was used to test the overall significance of the regression model. The null hypothesis for this test is that the predictor variables do not have explanatory power ($\beta 1 = \beta 2 = \beta 3 = 0$). The p-Value of <0.001 means that the R squared is significantly greater than zero thereby our predictors can account for a significant amount of variance in good governance. With a significant p-value, we reject the null hypothesis and adopt the alternative hypothesis and conclude that the predictors have explanatory power ($\beta 1 \neq \beta 2 \neq \beta 3 \neq 0$). Therefore, the regression model is significant ($F_{(3, 173)} = 53.277$, $p<0.001$; $R^2=0.485$)

Table 4.13 Multiple Regression Coefficients

Coefficients							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	.840	.269		3.727	.000		
IFMIS features	.780	.098	1.015	10.518	.000	.325	3.074
IFMIS Technical Security risks	-.378	-.077	-.478	-4.902	.000	.319	3.137
IFMIS Security Risks Controls	.444	.081	.035	.542	.589	.744	1.344

Predictors: (Constant), IFMIS features, IFMIS Security Risks, IFMIS Security risks controls

Dependent Variable: Good governance (Accountability and Transparency)

Source (Research data, 2022)

From the results, the following multiple linear regression model was fitted,

$Y = 0.141 + 0.260X1 + 0.348\ X2 + 0.367X3$

Where;

Y – Good governance (transparency and accountability)

X1 – IFMIS features

X2 – IFMIS security risks

X3 – IFMIS security risks controls

Multiple regression analysis was used to determine whether independent variables, (IFMIS features, IFMIS security risks, IFMIS security risks controls) simultaneously influence the dependent variable (Y) which is good governance. From the regression results in Table 4.13, the beta coefficients X1 ($\beta = 1.026$, p value < 0.001), X2 ($\beta = 0.378$, p-value < 0.001), and X3 ($\beta=0.44$, p-value < 0.001) implies a significant relationship between, (IFMIS features, IFMIS security risks, IFMIS security risks controls) and good governance. In this regard, a 100% increase in IFMIS features would increase good governance by 78% all other factors held constant.

Similarly, holding other factors constant (IFMIS security risks, IFMIS security risks controls) a 100% increase in IFMIS security risks would lead to a 62.2% decrease in good governance as the beta stands as (-.378) whereas when IFMIS security risks controls are increased by 100%, they would increase good governance be 44% . From the above multiple linear regression model holding (IFMIS features, IFMIS security risks, IFMIS security risks controls) constant, good governance 0.840. It can be seen that all the independent variables have a positive influence on the dependent variable, but IFMIS features and IFMIS security risks have a larger effect on good governance as compared to IFMIS security risks controls. The overall feeling of the respondents is that all independent variables had a significant influence on the dependent variable good governance.

4.5 Chapter Summary

The chapter-analysed data based on the findings presented from the study. The information captured was then interpreted using the relevant literature. The chapter also provided a summary of the key findings in relation to the objectives of the study covering the theoretical and the empirical fundamentals.

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter five presents' discussions of findings from the research, conclusions arrived after analysing the data, recommendations, and suggestions for future research. The study sought to establish effectiveness of IFMIS in enhancing transparency and accountability in county governments PFM in Kenya.

Section 5.1 introduces the chapter; Section 5.2 gives a detailed discussion in summary form of the study results, while section 5.3 gives conclusions arrived at the end of the study based on facts arrived at. Section 5.4 wraps up the research by proposing recommendations in the same field with areas that can be studied for further studies in the same field.

5.2 Discussions

5.2.1 Effect of IFMIS Features In Relation To Good Governance In County Governments In Kenya

Findings from descriptive analysis indicate that majority of the county governments are effectively using IFMIS features in PFM to ensure credibility and accuracy of financial data. IFMIS has also helped in ensuring real time financial transactions thus seamless delivery of services. Consequently, IFMIS has been fully adopted by county governments for report generation on budgets, projects, and resource allocation as well as financial data backup all with an average (Mean=3.4517, SD=1.2909 and Coefficient=37.7709%). The 37% variation indicate that counties have to a large extend adopted IFMIS in PFM to ensure accountability and transparency at 63%.

These benefits have also been highlighted in previous research, like Kaimenyi (2016) who established that some of the benefits of IFMIS include production and efficient access to dependable financial data, firming of government financial controls, enhanced provision of government services, increased transparency, and accountability in the budget process, and fast-tracking government operations.

The findings are also consistent with the findings of a study by Odoyo et al. (2014) who showed that the IFMIS system was reliable and flexible and hence affected financial performance positively. The findings further concur with the findings of a study by Bonface (2016) whose results revealed that IFMIS system helped organizational performance to effective and efficiency through cash management, budgeting, and reporting. All the above arguments tend to resonate with the (GoK 2011) call for adoption of IFMIS, as “the main reason for adopting IFMIS among county governments is to reduce corruption and ensure efficiency in management of public funds (GoK 2011)”.

However, despite all the benefits that come with IFMIS use in PFM as discussed above, there was a comparatively low mean on use of IFMIS to enhance accountability and authorization of financial transactions (Mean=3.1379, SD=1.3576) as compared to the best mean of 3.9310. This indicates system effectiveness is as good as those entrusted to use it, which now brings a whole difference in effectiveness of IFMIS in PFM. This revelation is in total agreement with a study by Diamond and Khemani (2013) whose study on systems established that effectiveness of a system is as good as those entrusted to operate the system. General study findings resonate well with the selected study theory whereby the results indicate that the system has more benefits if well used in PFM even though simple authorization on financial transaction with malicious intent will compromise the whole system effectiveness in PFM.

In the theory, the perceived usefulness component in Technology Acceptance Model is the degree to which a computer system user believes that using a particular computer system will enhance his or her performance (Opoku & Enu-kwesi, 2020). It usually refers to consumers' perceptions based on the outcome of their experience. The existence of perceived usefulness has significantly been recognized as the study findings have highlighted above. Findings further indicate that perceived usefulness (effectiveness of IFMIS in PFM) has the strongest impacts on intention to use (Accountability and transparency in PFM).

These results are compatible with previous study by (Ananda 2020) which found that perceived usefulness and perceived ease of use are the major factors in determining behavioural intention towards technology adoption. The findings therefore align with the theory’s perceived role of a system that utilizes parameters such as increasing speed thus creating effectiveness, making work easier and increase in production. The study

thus supports adoption of IFMIS in PFM among county governments to enhance accountability and transparency.

5.2.2 IFMIS Technical Security Risks in Relation to Good Governance in County Governments in Kenya

IFMIS technical security risks have a direct influence on good governance (PFM accountability and transparency). This study established that IFMIS use in county governments suffered a number of risks either cyber or human related risks. County government IFMIS systems tend to suffer majorly from human related threats though there is also a considerable cyber related risk. Generally, inferential statistics indicated that there is a significant relationship between IFMIS security risks and good governance. IFMIS technical security risks explains 36.9% of variation in accountability and transparency. There are a number of ways through IFMIS security risks can compromise accountability and transparency in PFM. For instance, cyber related threats tend to steal the information or totally freezing the system. On the other hand, human related risks majorly tend to lead to alteration of data thus presentation of false information.

In this study scenario, though it has been overlooked, it has singled out human threat as the most lethal threat on the use of IFMIS in PFM. The study findings agrees with Naomi (2014) study which established that the worsening of public finance performance has not only triggered questions of integrity on the officers involved but also stirred up mixed reactions from the public on the effectiveness of systems and the people involved in government strategies. In addition, 2016 survey by the Auditor general in Kenya (National government audit report, 2016) showed that there is a wide gap between the finances received by state corporations and the results provided as to how this finance had been used (Moses & Mutua, 2016).

In the TAM theory, previous studies on electronic commerce found that perceived risk directly affects the acceptance of technology (Micheni, 2015). There are certain risks involved in using all technologies, and IFMIS is no exception as it also relies on the availability of an Internet connection and the use of authentication codes. TAM defines perceived usefulness as the extent to which systems assists consumers in providing convenience and protection from fraud via skimming and counterfeiting. Study findings

indicate that perceived IFMIS security risks in PFM have a negative impact on perceived accountability and transparency (usefulness and intention to use) of IFMIS in PFM.

Overall, these results are parallel with the findings of prior studies such as Chawla and Joshi (2020), which support the idea that perceived risk has a negative influence on perceived usefulness and intention to use financial systems. In summary, the study has established IFMIS security risks affecting accountability and transparency in PFM among county governments that can now be linked to the mismanagement of public funds and errors in processing of financial statements. Even though cyber security risks have been identified, human related risks have also been identified and in fact categorized as though minute, lethal towards achieving transparency and accountability.

5.2.3 IFMIS Risk Controls in Relation to Good Governance.

Relevant IFMIS security risks controls ensure that the system is still functional and financial information available despite the threat and its magnitude. All the county governments have adopted standard IFMIS security risks countermeasures fairly, though with much attention on cyber than human related countermeasures.

Adoption of data back-ups, strict use of individual password to access the system, use of firewalls to protect the IFMIS servers, and use of encryption to transfer data are being implemented to ensure IFMIS security in PFM. Relevance of IFMIS risk security countermeasures are as good as the system itself thus it's the responsibility of all those involved to make sure the system is working and functional. The above study results are consistent with Alqahtani, (2017) study which established that organization information and data must be protected from active and passive attacks and be secured from illegal access, unwanted interruption, unauthorized alteration or annihilation.

On the other hand, much consideration was observed when it comes to staff training among other IFMIS security risks countermeasures. This revelation is justified by descriptive study results which indicate that, staff training as a major IFMIS security risk countermeasure in PFM Mean- 3.6552. Diamond and Khemani (2013) study on systems established that effectiveness of a system is as good as those entrusted to operate the system.

In the TAM theory, perceived relevance of a technology influences perceived intention to use. This relates to study finding which indicate that, relevance of IFMIS security risks have a direct influence on accountability and transparency of IFMIS in PFM. This This result is consistent with Shaw and Kesharwani (2019) who suggested that less complicated and secure technology is perceived to be more useful by users. Previous studies on acceptance and continuation of electronic financial systems have confirmed that a confirmation of expectations ensures continued use of certain services (Mirkovski & Lowry, 2016).

Generally, the study has identified that IFMIS accountability and transparency in PFM is as good as the risk controls county governments have put in place not only cyber related, but also human related. This thus calls for county governments to invest heavily on human related IFMIS security risks controls in order to achieve 100% transparency and accountability in PFM. In so doing, the researcher believes that the issues of altered data, missing records or misappropriation of resources, which are all a recipe for corruption, will be solved completely.

5.3 Conclusions

Based on the research findings, it can be concluded that effective adoption of IFMIS in PFM can greatly influence governance (accountability and transparency). Looking at the first objective, the study concludes that effect of IFMIS features in PFM is a recipe for accountability and transparency in PFM. IFMIS system features ensures financial data security through system audit trails; the system ensures timely provision of information through secure storage and lastly the system supports informed decision making through timely generation of factual reports. Even though the system is capable of all the stated functions, the study has identified that the system still suffers from human related threats as a significant level such as data altercation, password sharing, malicious authorizations, error in data input all with an average mean of over 3.0. The study thus revealed that staff training with a mean = 3.6552 as the best solution to major of the human related threats facing the system in PFM. If the challenge is corrected as recommended as highlighted, the study concludes that the system is timely and well suited to ensure accountability and transparency in PFM.

5.4 Recommendations

Based on the study findings and study objective of effectiveness of enhancing accountability and transparency in PFM, the study recommends the following: First, based on the first objective, the study recommends that all county governments to ensure 100% integration of their financial activities and records in the IFMIS system. To do away with manual systems because of internet interruptions, the study recommends to county governments the use of offline modules that synchronize the data when the system is back online, instead of resorting to manual systems. The study also recommends continuous data back-up with the central government of all IFMIS transactions within county governments to ensure security and availability of data at all times.

On the second and third objectives; IFMIS technical security risks in PFM and effectiveness of IFMIS technical security risk countermeasures, the study recommends that county governments should invest more on human training to avoid data entry integrity related challenges compromising integrity of IFMIS in PFM. The study also recommends staff vetting to ensure competent IFMIS officers are retained to ensure data integrity.

Finally, the study recommends that county governments to update their cyber security countermeasures on data transmission and storage as well as ensuring all finance offices have adequate network to avoid staffs connecting to unsecured networks which are a recipe for IFMIS hacking.

5.5 Recommended Areas for Further Studies

For further studies, the researcher recommends that future scholars to look at the role of finance staff wellness on use of IFMIS if the county governments are to achieve 100% accountability and transparency in PFM. From research, human error has been identified as among the major threats, thus a study on wellness of IFMIS users in terms of Training, Remuneration, and Expertise will form a good research on the existing literature around role of IFMIS in PFM.

Another area of study recommended is role of IFMIS end users in ensuring IFMIS accountability and transparency in PFM. For Instance, can the system be made public with end users restricted to “view only” so that they can see all the transactions being undertaken and at what level are the projects so as to increase accountability and transparency in PFM.

Lastly, based on the study findings, the research recommends a study to be done on reasons for continued existence of manual and overlapping systems despite having IFMIS in place. This will go a long way in blending this research effectiveness of IFMIS in ensuring accountability and transparency in PFM.

All the above recommended study areas combined with this study recommendation will ensure the public gets to benefit more from the system as the issue of accountability in PFM will have been looked at both from the IFMIS as a system side, IFMIS user side, IFMIS end user side and IFMIS technological point of view side. This will thus ensure proper resource allocation, reduced corruption, timely finishing of projects and seamless processing of transactions.

REFERENCES

Alqahtani, F. H. (2017). Developing an information security policy: A case study approach. *Procedia Computer Science, 124*, 691–697.

Ann, W. (2012). *The effects of integrated financial management information system on financial performance of commercial state corporations in Kenya*. The University of Nairobi.

Apaza, C. R. (2012). Ensuring accountability and transparency through integrated public management systems. *Political Science & Politics*, *45*(3), 435–441.

Babbie, E. (2002). *The basics of social research*. Wadsworth Thomson Learning.

Backhouse, E. (2018). *Information security Management in the New Millennium* (Vol. 43). ACM.

Barbara, J., & Clarke, A. M. (1998). The purpose and use of questionnaires in research. *Professional Nurse*, *14*(3), 176–179.

Bartel, M. (2009). *Integrated Financial Management Systems: A Guide to Implementation Based on the Experience in Latin America*. GSDRC. https://gsdrc.org/document-library/integrated-financial-management-systems-a-guide-to-implementation-based-on-the-experience-in-latin-america/

Bonface, P. O. D. (2016). Role of integrated financial management information system on organizational performance. *International Journal of Management and Commerce Innovations*.

Bosire, K. (2016). *The impact of integrated financial management information system (IFMIS) on financial probity in the public sector in Kenya*. The University of Nairobi.

Brayman, A. (2015). *Business research methods.* Oxford University Press.

Business Daily. (2019). *Integrated information management system*. Business Daily. https://www.businessdailyafrica.com/bd

Campos, J., & Pradham, S. (2007). *The many faces of corruption: Tracking vulnerabilities at the sector level.* World Bank.

Casals, A. (2009). *Integrated Financial Management Systems Best Practices* (AEP-I-00-00-00010-00; Transparency and Accountability). USAID.

Chado, H. (2015). *The effects of integrated financial management information system on the financial management of public sector in Kenya*. The University of Nairobi.

Chandaran, E. (2004). *Research methods: A quantitative approach with illustrations from Christian ministries*. Daystar University.

Collins, L. (2013). *Access Controls. In Computer and Information Security Handbook*. Morgan Kaufmann.

Commonwealth Secreatariat. (2015). *Guidelines for Public Financial Management Reforms*.

Creswell, J. W. (2012). *Qualitative Inquiry and Research Design: Choosing among Five Approaches* (2nd edition). SAGE Publications, Inc.

Cronbach, L. J. (1951). *Coefficient alpha and the internal structure of tests*. *16*(3), 297–334.

Deloitte. (2018). *Information Technology Risks in Financial Services: What board members need to know-and do*.

Dener, C., & Min, S. (2013). *Financial management information systems and open budget data: Do governments report on where the money goes*. World Bank.

Dhilon, G. (2018). Violation of Safeguards by Trusted Personnel and Understanding Related Information Security Concerns. *Computers & Security*, *20*(2), 162–172.

Diamond, J., & Khemani, P. (2005). On the advice of foreign aid agencies to adopt IFMIS. *Accounting, Organizations and Society*, *12*(1), 49–61.

Diamond, J., & Khemani, P. (2013). *Introducing Financial Management Information Systems in Developing Countries*. 33.

Doherty, N., Anastasakis, L., & Fulford, H. (2009). The information security policy unpacked: A critical study of the content of university policies. *Int. J. Inf. Manag.* https://doi.org/10.1016/j.ijinfomgt.2009.05.003

Eloff, J. H. (2018). What makes an effective information security policy? *Network Security*, *6*(2), 14–16.

Esther, N. (2008). *Enhancing the performance of the public service in a developmental state*. 1–26.

Fredrick, O., & Sarah, C. (2014). Integrated Financial Management Information System and its effect on cash management in Eldoret West District Treasury, Kenya. *International Journal of Business and Social Science*, *5*(8), 31–38.

GoK. (2011). *Integrated Financial Management Information System (IFMIS) IFMIS ReEngineering. From Modular, to Full Cycle End–To-End Processes, Strategic Plan 2011- 2013*. Government printer.

Gonzalez, J., & Sawicka, D. (2018). *A Framework for Human Factors in Information Security.* WSEAS International Conference on Information Security, Rio de Janeiro.

Haruna, P., & Doorgapersad, S. (2016). *Public budgeting in African nations: Fiscal analysis in development management*. Rutledge, Taylor & Francis Group.

Hendriks, C. J. (2012). Integrated Financial Management Information Systems: Guidelines for effective implementation by the public sector of South Africa. *SA Journal of Information Management*, *14*(1). https://doi.org/10.4102/sajim.v14i1.529

Hovav, A. D. (2018). User Awareness of Security Countermeasures and Its Impact on Information Systems Misuse: *Information Systems Research,* 1–20.

Jane, K. (2012). *Challenges facing state corporations in Kenya in the implementation of human resource management information systems*. The University of Nairobi.

John, K., & Ambrose, J. (2015). Integrated financial management information system (IFMIS) and credit scoring in cooperative societies: A case of deposit taking SACCOS in Nyeri County, Kenya. *International Journal of Innovative Research and Development*, *4*(3), 65–74.

John, K., & Eva, N. (2014). Factors influencing implementation of integrated financial management information system in Kenya Government Ministries. *Research Journal of Finance and Accounting*, *7*, 10–19.

Julias, N., & Kalundu, K. (2014). Effects of integrated financial management information system on performance of public sector: A case study of Nairobi County Government. *International Journal of Social Sciences and Entrepreneurship, 1*(12), 1–23.

Kahianyu, W. A. (2013). *The effect of integrated financial management Information system on public financial management and service delivery of government ministries in Kenya*. http://erepository.uonbi.ac.ke/handle/11295/63457

Kimwele, J. M. (2011). *Factors affecting effective implementation of inter grated financial management information systems (IFMIS) in government ministries in Kenya*. https://www.semanticscholar.org/paper/FACTORS-AFFECTING-EFFECTIVE-IMPLEMENTATION-OF-INTER-Kimwele/53b3658ba6088296c5a9d302519978e400cfac7d

Kinyeki, C., & Kipsang, W. (2008). Computing accounting systems in developing bureaucracies. Lessons from Kenya. *Public Budgeting and Finance*, *16*(4), 45–58.

Kothari, C. R. (2017). *Research methodology: Methods and techniques*. New Age International.

Leonard, L. T. (2018). What influences IT ethical behavior .planned behavior, reasoned action, perceived importance, or individual characteristics? *Information & Management*, *42*(1), 143–158.

Levin, R. I., & Rubin, D. S. (1994). *Statistics for Management*. Prentice Hall.

Magklaras, G. (2015). A preliminary model of end user sophistication for insider threat prediction in IT systems. *Computers & Security, 24*, 371–380.

Micheni, E. M. (2015). Using the technology organization environment framework for adoption and implementation of cloud computing in institutions of higher learning in Kenya. *The International Journal of Engineering and Science*, *4*(9), 37-43.

Mirkovski, K., & Lowry, P. B. (2016). Factors that influence interorganizational use of information and communications technology in relationship-based supply chains: Evidence from the Macedonian and American wine industries. *Supply Chain Management: An International Journal*, *21*(3), 334–351. https://doi.org/10.1108/SCM-08-2015-0343

Mohamed, A. (2007). *The impact of integrated financial management information system on economic development: The case of Ghana.* Korea University.

Moses, M., & Mutua, S. (2016). Influence of Integrated Financial Management Information System on Financial Management in county government of Nakuru, Kenya. *International Journal of Economics, Commerce and Management*, *4*(5), 777–794.

Naomi, W. (2014). Factors affecting management of finances in Kenya's public sector: Case study of Parastatals in Nakuru town. *International Journal of Social Sciences and Research*, *3*(10), 626–634.

Neely, A. (2007). *Business performance measurement: Unifying theories and integrating practice.* Cambridge University Press.

Njeri, E. (2016). *Stakeholder perception on implementation of public E-procurement in Kenya*. Strathmore University.

Njonde, K., & Kimanzi, K. (2014). Effect of integrated financial management information system on performance of public sector: A case of Nairobi County Government. *International Journal of Social Sciences and Entrepreneurship*, *1*(12), 913–936.

Noah, S. (2015). Effects of IFMIS implementation on supply chain management performance in the devolved government systems in Kenya: A case of Nairobi city county government. *International Academic Journal of Procurement and Supply Chain Management*, *1*(5), 1–26.

Odoyo, F., Adero, P., & Chumba, S. (2014). Integrated financial management information system and its effect on cash management in Eldoret west district treasury, Kenya. *Undefined*. https://www.semanticscholar.org/paper/Integrated-financial-management-information-system-Odoyo-Adero/f1c17ce62f67473c4c3b9216aa180252994bdda9

Ogutu, J. H. (2014). *Entreprise resource planning systems and performance of power sector in Kenya* [Thesis]. University of Nairobi.

Olabisi, M., & Oladosu, B. (2017). Effects of integrated financial management information system on performance of public sector in Nigeria. *International Journal of Engineering Technologies and Management Research*, *4*(7), 1–8.

Omokonga, S. (2014). *The effect of Integrated Financial Management Information System on the Performance of Public sector organizations* [Thesis, United States International University - Africa]. http://erepo.usiu.ac.ke:8080/xmlui/handle/11732/110

Opoku, M. O., & Enu-kwesi, F. (2020). *Relevance of the technology acceptance model (TAM) in information management research: A review of selected empirical evidence*. https://doi.org/10.17261/pressacademia.2020.1186

Orgil, G. G. (2017). *The Urgency for Effective User Privacy-education to Counter Social Engineering Attacks on Secure Computer Systems*. SIGITE.

Parker, D. (2018). *Fighting Computer Crime: A New Framework for Protecting Information*. John Wiley & Sons.

Robinson, M. (2007). *Performance Budgeting.* International Monetary Fund.

Sacca, D. (2018). *Information Systems: People, Organizations, Institutions, and Technologies.* Physica-Verlag.

Saraireh, S. (2013). A secure data communication system using cryptography and steganography. *International Journal of Computer Networks & Communications*, *5*(3), 125–137.

Saunders, M. (2008). *Research Methods for Business Students. Research methods for business students*. Pearson Prentice.

Shah, A. (2007). *Budgeting and budgetary institutions*. World Bank.

Shaw, B., & Kesharwani, A. (2019). Moderating Effect of Smartphone Addiction on Mobile Wallet Payment Adoption. *Journal of Internet Commerce*, *18*(3), 291–309. https://doi.org/10.1080/15332861.2019.1620045

Sjoberg, L., & Fromm, J. (2001). Information technology risks as seen by the public. *Risk Analysis*, *21*(3), 427–442.

Stoneburner, G., Goguen, A., & Feringa, A. (2002). *Risk Management Guide for Information Technology Systems.* (NIST Special Publication). National Institute of Standards and Technology.

Szilagyi, J. (2018). Information security management in the new millennium. *Communications of the ACM*, *43*(7), 125–128.

Taylor, L. P. (2006). *FISMA Certification and Accreditation Handbook*. Elsevier.

Torkzadeh, F. (2018). Value-focused assessment of information system security in organizations. *Information Systems Journal*, *16*(3), 293–314.

Transparency International. (2013). *Transparency International 2013 Corruption Perceptions Index*. Lexology. https://www.lexology.com/library/detail.aspx?g=aa4bfb22-99fc-4959-865e-7bf245f17c1b

Tromp, K., & Kombo, D. K. (2006). *Proposal and Thesis writing. An Introduction*.

Uganda Ministry of Finance, P. (2015). *The effectiveness of the integrated financial management system in Uganda: Study report*. Ministry of Finance, Planning and Economic Development.

USAID. (2008). *Integrated financial management information systems. A practical guide* (pp. 1–44). USAID.

Wamsteker, W. (1989). *IUE-ULDA access guide: International Ultraviolet Explorer- Uniform Low Dispersion Archive*. ESA Publications Division.

Wanyama, I., & Zheng, Q. (2011). The Fit Between Organizational Structures and IS Implementation: The Case of IFMIS in Kenya. *International Journal of Trade, Economics, and Finance*, *2*(2), 131–137.

Westerman, G., & Hunter, R. (2007). *IT Risk: Turning Business Threats Into Competitive Advantage*. Harvard Business School Press.

Westhausen, H. (2017). The escalating relevance of internal auditing as anti-fraud control. *Journal of Financial Crime*, *24*(2), 322–328.

Zikmund, G. W., Babin, B. J., & Griffin, G. (2009). *Business Research Methods* (8th ed.). South-Western College Pub.

APPENDICES

Appendix I. Introduction Letter

Date……

P.O Box……

Nairobi

Dear Sir/Madam

RE: REQUEST TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT

My name is **Wycliffe Ondego Timbwa.** I am a Masters student at Strathmore University, Nairobi Kenya doing a research titled **"Effectiveness Of IFMIS In Enhancing Governance In County Governments PFM In Kenya."** I have designed a questionnaire to collect data from all counties solely for academic purposes. The purpose of writing to you is to request your permission to collect data on this subject from your selected county finance staffs.

Kindly note that data collected will be treated with utmost confidence with strict adherence to your county finance by-laws. Study results will not include reference to any individual.

Your acceptance will be highly appreciated.

Yours sincerely

Ondego W. Timbwa.

Appendix II: Research Questionnaire

My name is **Wycliffe Ondego Timbwa.** I am a Masters student at Strathmore University, Nairobi Kenya doing a research titled **"Effectiveness Of IFMIS In Enhancing Governance In County Governments PFM In Kenya."**

A questionnaire has been designed to collect data from your respective county solely for academic purpose. Kindly note that data collected will be treated with utmost confidentiality and privacy, and only used for purposes intended.

Thank you.

Section A: Background Information

1. Age Bracket (Tick the appropriate one)

a)18-26 ☐ b)27-35 ☐ c)36-44 ☐ d)45-52 ☐ e)53-60 ☐

2. Academic qualification

What is your highest level of education? (Tick the appropriate one)

a)Certificate ☐ b)Undergraduate ☐ c)Masters ☐ d)PhD ☐

3. What is your current position in the county finance department?

a) County finance executive ☐

b) Finance officer ☐

c) County accountant ☐

4. How long have you served in your position since inception of counties?

1-3 years ☐ 4-6 years ☐ Above 8 years ☐

SECTION B IFMIS features in relationship to enhancing good governance

This section aims at establishing the effectiveness of IFMIS in ensuring accountability in financial management budgeting, cash management and planning. Please Indicate to what extent you agree to the statements provided using Likert scale where

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Statement	**1**	**2**	**3**	**4**
IFMIS seeks to ensure financial data security and validity through audit trails.				
IFMIS seeks to provide storage of financial information through data back ups				
IFMIS seeks to ensure enhanced level of accountability in financial transactions due to its provision of authorizations and approvals				
IFMIS seeks to enable real time financial transactions capture thus minimizing on fraud related to data alteration				
IFMIS seeks to provide automated reports on cash and projects ensuring transparency				

SECTION C: Technical Risks Associated With Use Of IFMIS In Relation To Good Governance

This section aims at establishing technical security risks associated with the use of IFMIS in enhancing accountability and transparency in managing public financial services .Please indicate to what extent the statements applies using Likert scale where

1 = None 2 = little 3 = Moderate 4 = Large 5 = Very large

Statement	**1**	**2**	**3**	**4**	**5**
Malicious data alteration poses a major threat to IFMIS					
IFMIS hacking aimed at denying county of financial services poses security risk					
IFMIS suffers data integrity due to errors during data input					
Password sharing is a major threat to IFMIS usage					
Use of unsecured access points exposes IFMIS to hacking					

Section D. IFMIS Risk Controls In Relation To Good Governance

This section aims at establishing the relevance of IFMIS risk countermeasure in relationship to accountability and transparency in PFM Please indicate to what extent the statements applies using Likert Scale where

1 = None 2 = Little 3 = Moderate 4 = Large 5 = Very Large

Statement	**1**	**2**	**3**	**4**	**5**
Continuous data back-up on secure servers ensures financial information is readily available					
Restricting access to IFMIS domain by use of firewalls and VPNs has enhanced security of PFM information on IFMIS					
Secure data transmission through use of data encryption unsure safety of data on transit					
Use of authorized personnel to restricts access to registered users					
Continuous staff training increases staff security awareness					

Thank you for your feedback

Appendix III: Introduction Letter From Strathmore University

Ole Sangale Rd, Madaraka Estate,
P.O Box 59857-00200, Nairobi Kenya.
Cell: +254 (0) 703 034 720, Twitter: @SBSKenya
Email: info@sbs.strathmore.edu Website: www.sbs.strathmore.edu

Strathmore UNIVERSITY BUSINESS SCHOOL

6th September 2021

To whom it may concern,

Dear Sir/ Madam

RE: FACILITATION OF RESEARCH – WYCLIFFE TIMBWA

This is to introduce Wycliffe Timbwa who is a Master of Commerce (MCOM) Student at Strathmore University Business School, admission number MCOM/52452. As part of our MCOM Program, Wycliffe is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MCOM course. To this effect, Wycliffe would like to request for appropriate data from your organization.

Wycliffe is undertaking a research paper on "**ROLE OF INTEGRATED FINANCIAL INFORMATION SYSTEMS (IFMIS) IN ENHANCING TRANSPARENCY AND ACCOUNTABILITY IN COUNTY GOVERNMENTS.**" The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MCOM seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Njoki Kiagiri
Associate Manager – Graduate Programs.
Strathmore University Business School.

Appendix IV: Ethical Review Clearance

Strathmore UNIVERSITY

16th February 2022

Mr Timbwa, Wycliffe
timbwaw10@gmail.com

Dear Mr Timbwa,

RE: Effectiveness of Ifmis In Enhancing Transparency And Accountability In County Governments Pfm In Kenya

This is to inform you that SU-IERC has reviewed and approved your above SU Master's research proposal. Your application reference number is SU-IERC1193/21. The approval period is 16th February 2022 to 15th February 2023.

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: Prof Pred Were,
Chairperson; SU-IERC

SU-IERC
16-Feb-2022

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix V: Research Permit From NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **734519**

Date of Issue: **25/February/2022**

RESEARCH LICENSE

This is to Certify that Mr.. WYCLIFFE Ondego TIMBWA of Strathmore University, has been licensed to conduct research in Nairobi on the topic: EFFECTIVENESS OF INTEGRATED FINANCIAL INFORMATION SYSTEMS (IFMIS) IN ENHANCING TRANSPARENCY AND ACCOUNTABILITY IN COUNTY GOVERNMENTS FINANCIAL SERVICES: CASE STUDY OF NAIROBI COUNTY for the period ending : 25/February/2023.

License No: **NACOSTI/P/22/16006**

734519

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix VI: Participant's Information And Consent Form

Effectiveness Of Ifmis In Enhancing Good Governance In County Governments Pfm In Kenya

SEcTIoN 1: INFORmATION SHEET

Investigator: Wycliffe Ondego Timbwa

Affiliated Institution: Strathmore University (SBS)

SEcTIoN 2: INFORmATION SHEET– The Study

2.1: Reason For Carrying Out The Study?

The study seeks to establish the effectiveness of IFMIS in ensuring good governance in public financial management in county governments, with the aim of:

i. To establish effect of IFMIS features in enhancing good governance in county governments in Kenya
ii. To establish IFMIS security risks in relation to good governance in county governments in Kenya.
iii. To establish IFMIS security risk controls in relation to good governance

All this is geared towards addressing the misappropriation of resources and uneven distribution of resources in county governments

2.2: Is It Compulsory To Take Part?

No, participation in the study is exclusively voluntary and the choice is entirely with the individual. In case you resolve to participate, you will be invited to fill a questionnaire to obtain data. In case of inability to respond to all the questions effectively on the first attempt, one may be requested to sit over a second time to attempt the questions. Respondent is at liberty to decline not to participate in this study at whichever interval devoid of providing any details.

2.3: Who is suitable to participate in this study?

 County executives

 Finance officers

 County accountants

2.4: Who is not eligible to take part in this study?

 Any other person not working in the finance

2.5: What Is My Involvement In Participating In This Study?

The researcher, Wycliffe Ondego Timbwa will approach you with a request to participate in this study. If you are contented and fully comprehend the aim of this study, the researcher will request you to append a signature for the informed consent thereafter you will be guided through on how to fill the questionnaire.

2.6: What Probable dangers and Risks Will Be Encountered in participating in this study?

None. We have not envisioned any foreseeable danger in participating in the study. All information provided will be handled with utmost confidentiality and only for purposes of this academic research.

2.7: How beneficial is it to take part in this study?

Data provided will be used to advance the understanding and management of public funds and resources by sealing the gaps that causes misuse of public resources. This will be effected by ensuring there is transparency and accountability in public financial management in county governments on the people and systems entrusted to manage public funds

2.8: What Happens If I Decline Participating in this study?

You will not be victimized for not taking part in this study as your involvement in the study is volitional and voluntary. If you decide to participate in the first attempt and later decide to opt out, you are obliged to renounce your decision without giving any clarification. No staff should feel uncomfortable or afraid for not having participated in the study, nevertheless it will be very noble for the participant to kindly at his or her own desire to provide the relevant information, and the researcher will be very humbled and grateful for the feedback received.

2.9: Who will have access to My data for the Period Of this Study?

Entire research data obtained shall be stored in safely protected cabinets. Data recorded in the database will adequately be coded and secured with a password. Simply authorized personnel involved with in the study will be authorized to access to information. Finally, your data and information provided will be handled with utmost confidentiality.

2.10: Who should be Contacted in Case Of Additional questions?

Kindly contact me, Wycliffe Ondego Timbwa at SBS, or via e-mail wycliffe.timbwa@strathmore.edu or by phone (0725617525).

You can also contact my supervisor, Dr. Mumbi Maria at the Strathmore Business School, Nairobi, or via e-mail (MWachira@strathmore.edu) or by phone (0792149980).

In case of intention to ask any autonomous person Questions Regarding this Study, Kindly contact:

The Secretary–Strathmore University Institutional Ethics Review Board, P. O. BOX 59857, 00200, Nairobi, email ethicsreview@strathmore.edu Tel number: +254 703 034 375

I, _____, confirm that the study has been clarified to me. I have mastered everything that I have perused, both explanations offered as well as questions asked have been responded to adequately. I fully comprehend that I can reverse my decision at any time.

CONSENT FORM

Kindly tick the Boxes as appropriate:

Participation in the research study:

☐ I ADMIT to participate in this study

☐ I DO NOT ADMIT to participate in this study

Preservation of information on the finalized questionnaire:

☐ I UNDERTAKE that my completed questionnaires be kept for future data analysis

☐ I DO NOT UNDERTAKE that my complete questionnaires be kept for future data analysis.

Participant's Signature: ……

Date / /

Participant Name

Time HR…… MN……

I, Wycliffe Ondego Timbwa confirm that I have upheld the standard operating procedures (SOP) for this research and clarified the information about the study to the participant above, and that s/he has discerned the nature and the purpose of the study and accepts to participate in this research. She/he has been accorded a chance to probe inquiries deemed to have been responded to adequately

Investigator's Signature: WTimbwa

Date: ___2___/_09_____/_2021_____

Investigator's Name: Wycliffe Ondego Timbwa

Appendix Vii: Research Plan/Calendar

Activity/Month	TIMETABLE										
	2021								2022		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Oct	Mar	Apr	July
Topic selection and approval	■										
Draft proposal with literature map		■	■								
Proposal writing incorporating supervisor comments				■	■	■					
Proposal Presentation							■				
Post defence corrections							■				
Pilot testing									■		
Data collection										■	
Data processing and analysis										■	
Supervisor review & Corrections											■
Thesis submission											■

Appendix Viii: Research Budget

No.	Item	Description	Cost (KES)
	Data Collection costs (Transport/Fuel/ Research assistants)	Data Collection	60,000.00
	Printing and Binding Costs.	Printing and binding	7,000.00
	Telecommunication & networking costs	Airtime and data bundles	20,000.00
	Sub Total		**87,000.00**

Appendix Ix: Similarity Index

Document Information

Analyzed document	Final Doc.docx (D139542551)
Submitted	2022-06-07T14:07:00.0000000
Submitted by	
Submitter email	Wycliffe.Timbwa@strathmore.edu
Similarity	19%
Analysis address	library.strath@analysis.urkund.com

Sources included in the report

SA	**ABONGO-PROPOSAL FINAL.docx** Document ABONGO-PROPOSAL FINAL.docx (D15586269)	2
SA	**final project research -A.docx** Document final project research -A.docx (D41923657)	5
SA	**IMPACT OF IMPLEMENTATION OF INTEGRATED FINANCIAL MANAGEMENT INFORMATION SYSTEM ON PUBLIC EXPENDITURE MANAGEMENT IN KENYA.docx** Document IMPACT OF IMPLEMENTATION OF INTEGRATED FINANCIAL MANAGEMENT INFORMATION SYSTEM ON PUBLIC EXPENDITURE MANAGEMENT IN KENYA.docx (D21059292)	2
W	URL: http://erepo.usiu.ac.ke/bitstream/handle/11732/3967/SAMMY%20LAMBA%20MBA%202018.pdf?sequence=1&isAllowed=y Fetched: 2021-03-05T01:03:48.8030000	54
SA	**Effects of IFMIS Use on Sevice Delivery in the Ministry of Devolution and Planning.pdf** Document Effects of IFMIS Use on Sevice Delivery in the Ministry of Devolution and Planning.pdf (D15861281)	1
SA	**THESIS YUVINALIS- MWISHO 2.docx** Document THESIS YUVINALIS- MWISHO 2.docx (D22817395)	2
SA	**Final project research -E.pdf** Document Final project research -E.pdf (D42507682)	1
W	URL: http://erepository.uonbi.ac.ke/bitstream/handle/11295/99525/Kasalu_Information%20Technology%20Risk%20Management%20In%20Integrated%20Financial%20Management%20Information%20System%20In%20Kenya.pdf?sequence=1 Fetched: 2021-09-03T18:25:59.4100000	25
W	URL: https://www.u4.no/publications/the-implementation-of-integrated-financial-management-systems-ifmis.pdf Fetched: 2021-06-25T10:00:50.1330000	1
SA	**Proposal Document- Grp 3.docx** Document Proposal Document- Grp 3.docx (D15034304)	4
SA	**FINAL DISSERTATION DRAFT THREE.docx** Document FINAL DISSERTATION DRAFT THREE.docx (D15735908)	1

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