

**SCHOOL MANAGEMENT INFORMATION SYSTEMS ADOPTION AND
PERFORMANCE OF SECONDARY SCHOOLS IN NAIROBI COUNTY**

BY

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DECLARATION

This research project is my original work and has not been submitted for examination in any other university.

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This research project has been submitted for examination with my approval as the University Supervisor

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DEDICATION

I dedicate this study project to God, my Creator, Redeemer and Sustainer. He renews my strength every day, enabling me to achieve this.

ABSTRACT

A number of crucial variables compel businesses worldwide to develop new applications in order to succeed. These include ongoing advancements in information technologies, information exchange, rising social expectations and current management perspectives and applications. Recently, the topic that has received the most attention is the contribution of technology to education. Technologies such as management information systems enhance performance management and evaluation. The main aim of this research was to determine the correlation of SMIS and performance of secondary schools in Nairobi County. Specific objectives were to establish the extent of SMIS adoption among secondary schools in Nairobi county, to establish the drivers of SMIS adoption among secondary schools in Nairobi county, to establish the challenges in SMIS adoption among secondary schools in the county of Nairobi, and to determine the relationship between SMIS adoption and performance among secondary schools in Nairobi county. This study employed a descriptive research design methodology. The population of the study was 252 public and private secondary schools in Nairobi country. The sample size was 75 schools. Primary data was collected using questionnaire. Research questionnaire was sent to 75 secondary schools in Nairobi county of which 71 schools responded, leading to 94.6% response rate. One representative filled the questionnaire in every school. The representatives included directors, principals, deputy principals, senior teachers, teachers and bursars. The questionnaire was edited for precision, clarity and completeness after the data that is needed has been obtained. To allow statistical analysis, the responses were coded into numerical form. Demographic data was presented using frequency and percentage. The extent of adoption was presented using mean and standard deviation. Data on drivers of adoption plus challenges faced during adoption was analyzed using mean and standard deviation. To establish the relationship between SMIS and performance of secondary schools, a regression equation was established. The study found that to a great extent that SMIS has been adopted for database management. The study also found that SMIS was in use for a duration of 4 to 6 years. The study found to a great extent that efficient communication with parents motivated the school to adopt SMIS. The study found to a great extent that fear of system failure was the main challenge the school faced in adopting SMIS. The study further found to a great extent that real time data reconciliation has improved after SMIS adoption. The study also concluded that database management contributed most to performance of secondary schools in Nairobi County, followed by sub-system integration. At 5% level of significance and 95% level of confidence, database management, sub-system integration, processing of information, and information dissemination were all significant on performance of secondary schools in Nairobi County. In order to enable the use of SMIS in management of schools, the study recommended facilitation in schools to enable purchase of computers and accessories, structured networks and fast internet to enable adoption of SMIS. Another recommendation was the introduction of SMIS lessons to staff members as this would support the development of SMIS skills in the institution.

TABLE OF CONTENTS

DECLARATION.....	ii
ACKNOWLEDGEMENTS	iii
DEDICATION.....	iv
ABSTRACT.....	v
LIST OF TABLES	ix
LIST OF FIGURES	x
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the study	1
1.1.1 Concept of Management Information System	2
1.1.2 School Management Information Systems	2
1.1.3 Drivers of SMIS Adoption.....	3
1.1.4 Challenges of SMIS Adoption.....	3
1.1.5 Performance of Secondary Schools	4
1.1.6 Secondary Schools	4
1.2 Research Problem	5
1.3 Research Objectives.....	7
1.4 Value of the Study	7
CHAPTER TWO: LITERATURE REVIEW.....	8
2.1 Introduction.....	8
2.2 Theoretical Review	8
2.2.1 Diffusion of Innovation Theory	8
2.2.2 Technology-Organization-Environment Theory	9
2.2.3 Goal setting theory.....	10
2.3 School Management Information System Adoption.....	10
2.3.1 Database Management	11
2.3.2 Sub-System Integration.....	11
2.3.3 Processing of Information.....	12
2.3.4 Information Dissemination	13
2.4 Drivers of SMIS Adoption.....	14
2.5 Challenges of SMIS Adoption	15
2.6 Performance of Secondary Schools	16
2.7 Empirical Review.....	16

2.8 Summary of Literature and Research Gaps	17
2.9 Conceptual Framework.....	18
CHAPTER THREE: RESEARCH METHODOLOGY	20
3.1 Introduction.....	20
3.2 Research Design.....	20
3.3 Population of the Study.....	20
3.4 Sampling	20
3.5 Data Collection	21
3.6 Data Analysis	21
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION	23
4.1 Introduction.....	23
4.2 Response Rate.....	23
4.3 Demographic Profile of the Study Respondents	23
4.3.1 Gender of the Respondents	23
4.3.2 Age of the Respondents	24
4.3.3 Highest Level of Education	24
4.3.4 Current Position in the School	25
4.3.5 Working Duration in the School	26
4.3.6 Student Population.....	27
4.3.7 Employees in the School.....	27
4.3.8 Age of the School.....	28
4.3.9 School Type	28
4.3.10 Nature of the School	28
4.3.11 Category of the School.....	29
4.4 Extent of SMIS Adoption among Secondary Schools in Nairobi County.....	29
4.4.1 Extent of Adoption of SMIS	29
4.4.2 Length of Use of SMIS	31
4.5 Drivers of SMIS Adoption Among Secondary Schools in Nairobi County	31
4.5.1 Extent of School Motivation to Adopt SMIS	31
4.6 Challenges in SMIS Adoption Among Secondary Schools in Nairobi County.....	32
4.6.1 Extent of Challenges in Adopting SMIS	32
4.7 Relationship Between SMIS Adoption and Performance.....	34
4.7.1 Extent of Performance After SMIS Adoption	34
4.7.2 Performance Improvement.....	35

4.8 Regression Analysis.....	35
4.8.1 Model Summary.....	36
4.8.2 ANOVA Results	37
4.8.3 Coefficient of Determination	37
4.9 Discussion of Findings.....	38
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	40
5.1. Introduction.....	40
5.2. Summary of Findings.....	40
5.3 Conclusion	41
5.4 Recommendations.....	41
5.5 Recommendations for Further Research.....	41
REFERENCES.....	42
APPENDICES	I
RESEARCH QUESTIONNAIRE	I
INTRODUCTION LETTER	VII

LIST OF TABLES

Table 4.1. Gender of the Respondents	24
Table 4.2. Age of the Respondents	24
Table 4.3. Highest Level of Education	25
Table 4.4. Current Position in the School	26
Table 4.5. Work Duration in the School	26
Table 4.6. Student Population	27
Table 4.7. Employees in the School.....	27
Table 4.8. Age of the School	28
Table 4.9. School Type	28
Table 4.10. Nature of the School	29
Table 4.11. Category of the School.	29
Table 4.12. Extent of Adoption of SMIS	30
Table 4.13. Length of Use of SMIS	31
Table 4.14. Extent of School Motivation to Adopt SMIS	31
Table 4.15. Extent of Challenges in Adopting SMIS	33
Table 4.16. Extent of Performance After SMIS Adoption	34
Table 4.17. Length of Use of SMIS	35
Table 4.18. Model Summary	36
Table 4.19. ANOVA of the Regression	37
Table 4.20. Coefficient of Determination	38

LIST OF FIGURES

Figure 2.1. Conceptual Model.....	21
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DEFINITION OF TERMS

AIS	Accounting Information System
API	Application Programming Interface
DBMS	Database Management System
DCs	Dynamic Capabilities
DFM	Dubai Finance Market
DOI	Diffusion of Innovation
EFA	Education for All
FDSE	Free Day Secondary Education
GST	Goal – Setting Theory
IS	Information System
LPO	Local Purchase Order
MIS	Management Information System
NEMIS	National Education Management Information System
SMEs	Small and Medium Enterprises
SMIS	School Management Information System
TOE	Technology-Organization-Environment Theory
UPE	Universal Primary Education
UK	United Kingdom

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

With the current uncertainties posed by the modern era characterized by technology advancement, organizations are necessitated to adapt to new information technologies, information exchange, rising social expectations and current management perspectives and applications (Szymkowiak et al. 2021). Information technology is prioritized in all sectors in the modern societies. The use of information systems has been considered in several investment plans all over the world (Abualoush et al., 2018). Recently, the topic that has received the most attention is the contribution of technology to education (Naim & Lenka, 2018). The Kenyan secondary schools have been focusing on implementation of technological framework to enhance service delivery.

Technologies such as management information systems enhance performance management and evaluation from the fact that student's performance can easily be monitored digitally with help of management information system. On the other hand, having suppliers' contacts stored on the SMIS enhances supply of secondary school's materials due to monitoring of materials depletion and quantities available on the digital platforms to ensure there is no shortage of supplies. Therefore, it is hypothesized from previous studies that School Management Information System (SMIS) can influence performance of secondary schools (Lucas, Nelson & Sims, 2020). To understand the potential effect of SMIS on performance of secondary schools, the study will be guided by three theories, namely; the diffusion of innovation (Rogers, 1995), the goal setting theory (Locke & Latham, 1994) and the Technology Organization Environment (TOE) theory.

1.1.1 Concept of Management Information System

Management information system (MIS) is a subtype of information systems (IS). It entails the convergence of computer science to offer systemic solutions for actual situations (Tummers, Kassahun & Tekinerdogan, 2019). Additionally, MIS investigates management and employee behavior in connection to the construction, implementation and impacts of information systems (Laudon & Laudon, 2015). Giving customers the proper information to make choices and handle different issues that may develop is one of the more widespread applications of MIS. Since reliable information is accessible in advance, these tools support their user in having an organized argument (Lapiedra & Devece, 2012). The systems, as opposed to other information systems, are utilized to evaluate and support operational and strategic activities (Tummers, Kassahun & Tekinerdogan, 2019). Computer systems known as MIS are used to manage people, processes, data, hardware, and software.

1.1.2 School Management Information Systems

The management information system known as SMIS is used in schools so as to fit a school's structure, management demands, instructional procedures and unique requirements (Lucas, Nelson, and Sims, 2022). SMIS may be broadly defined as improving program performance, professionalizing the teaching process and making changes to the learning environment and enabling instructors to share their experiences systematically (Luena, 2012). It also helps school administrators and other staff members carry out their duties by improving their performance, effectiveness and efficiency. SMIS complements the institution's strategic goals and direction and offers an impartial framework for gathering and documenting information. SMIS can be used to streamline the school's administrative processes and formal procedures (Gehlawat, 2014).

Using school management information systems, it is possible to maintain school records and data for every student, teacher and other staff members. Timetable module allows teachers to fill the school curriculum. Once a schedule is made, a teacher can make a manual adjustments to fit what they have in school (Amwoyo K., 2014). Additionally, SMIS can maintain data about institution management of facilities, assets and financial matters. SMIS examines a student's performance in each subject, form and topic, as well as study habits. SMIS generates performance analysis at the classroom level, student level, subject level and teacher level (Chunfeng Liu et al, 2011).

1.1.3 Drivers of SMIS Adoption

The key drivers that influence the user's intention of adopting mobile banking are perceived usefulness, perceived ease of adoption, the financial cost, high self-efficacy, system quality and the product integrity (Singh, S., et al, 2010). Other drivers include being aware of ICT and being receptive to organizational transformation (Gregor et al., 2004). The method outlined by Rogers (1983) is pertinent to the study of diffusion of innovation and appropriate to research its drivers because it already demonstrates several auxiliary components and serves as a theoretical framework to include more drivers. Organizations that are cognizant of ICT use a variety of particular ICT management techniques and gain from the organizational learning and change that comes with ICT adoption and deployment. Organizational transformation must be acknowledged as an essential companion to the adoption and deployment of SMIS.

1.1.4 Challenges of SMIS Adoption

Hardware incompatibility, technology complexity, language difficulties, lack of internet and computers and failure to comprehend technology benefits are some of the obstacles to using new technologies (Richardson J. W., 2011). The main challenge of adoption is the pace of technological

development (Harker and Akkeren, 2002). It is difficult for business owners and managers to adapt to the environment. The amount of skepticism about the IT sector, the price of technology and the rate of adoption of IT technologies are further challenges.

1.1.5 Performance of Secondary Schools

The definition of performance is the completion of a task. One of the pillars for economic development is good performance in education (Karanja, 2018). School administrators may make more efficient decisions if they have access to accurate and up-to-date information (Martins et al., 2019). In order to enhance performance in secondary schools, the key component is appropriate decision-making. Academic excellence, stakeholder satisfaction, discipline and school culture, land infrastructure development, financial stability and success in extracurricular activities will all be taken into account when evaluating performance in a school setting. Performance comparisons serve as a basis for executive evaluation, decision-making about the allocation of people and other resources, for writing history, and for inciting pride and shame (Martin, 2020). As a result, firm performance is a crucial component of a company (Karanja, 2018).

1.1.6 Secondary Schools

Secondary schools in Kenya play a significant role in enhancing education standards in the country. Early childhood through primary/elementary education are covered under the Kenyan educational system. Secondary education comes after that, followed by postsecondary education at a college or university level. Provision of free education some of government programs that have enabled every Kenyan child to access quality education (basic education act No.14 of 2013).

The strategic plan public schools ratify, is widely permeated by IT implementation. This plan should be in harmony with the 2020-2025 Ministry of Education's Strategic Plan, (Kagema &

Irungu, 2018). Evidently, implementation of technology frameworks such as SMIS in secondary schools is largely determined by factors like technology policy. The question of concern is therefore, whether SMIS in secondary schools leads to improved performance.

1.2 Research Problem

Management information system, just like any other innovative technological framework, enhances convenience of service delivery. As the educational system's demands have grown, stakeholders in secondary schools have been forced to make more decisions in a shorter amount of time (Martin, 2020). School administrators may make more efficient decisions if they have access to accurate and up-to-date information (Martins et al., 2019). In order to enhance performance in secondary schools, the key component is appropriate decision-making. Student administration, personnel administration and financial administration are among the administrative subsystems that should participate in decision making. As a result, implementation of school management information system can play a critical role in coordination of all these aspects of administration resulting to enhanced performance.

Numerous studies have examined how ICT, as a general technology notion, affects organizational performance. DeStefano, Kneller, and Timmis (2018) examined the ICT use, company performance and global broadband infrastructure using evidence from UK-based businesses. In turn, they discover that ICT has a causal impact on company size (as determined by sales or employment), but not on productivity. A study on the value of an accounting information system for listed businesses at the Dubai Financial Market (DFM) was conducted by Soudani in 2012. Data were gathered from 74 companies using questionnaires and a descriptive study methodology was used. The study's findings demonstrated that despite the importance of the systems, there was no improvement in performance.

Adeniran and Johnston (2016) looked into how ICT use and dynamic capacities (DCs) affected South Africa SMEs' ability to compete. The statistical data gathered demonstrated that ICT use improved competitive advantage. Individuals in charge of ICT in South African SMEs provided answers to a semi-structured questionnaire that was conducted online. The statistical data gathered demonstrated that ICT use improved competitive advantage.

There is a greater demand from school stakeholders on performance. Parents want prompt communication, academic performance updates and the fees status of their children. The government also demands more from schools. This has led to performance which leads to technology adoption though productivity paradox states that the usage of technology does not considerably boost an organization's overall efficiency (Solow, 1987). Several researches have been conducted in Kenya on ICT and performance. Omokonga (2014) found that there is a link between IFMIS and better financial reporting. In 2015, Wanjala performed research on instructors' perspective on how ICT is used in school management. ICT integration in public school management was the subject of research by Mutisya (2017).

From the studies reviewed, it is evident that information communication technology has a positive relationship with organization performance. However, the studies have not focused on MIS, particularly SMIS on performance. Secondly, the studies concentrated on different economic and industry aspect. In terms of how the school management information system affects performance, there is a gap. By addressing the research question, what relationship exists between SMIS and secondary schools' performance in Nairobi County? The current study aims to fill this gap.

1.3 Research Objectives

The main objective of this research is to determine the relationship between SMIS and performance of secondary schools in Nairobi County.

Specific Objectives

- i) To establish the extent of SMIS adoption among secondary schools in Nairobi county.
- ii) To establish the drivers of SMIS adoption among secondary schools in Nairobi county.
- iii) To establish the challenges in SMIS adoption among secondary schools in Nairobi county.
- iv) To determine the relationship between SMIS adoption and performance among secondary schools in Nairobi county.

1.4 Value of the Study

This research would be extremely helpful to the stakeholders in Kenya's education sector. The study will help stakeholders and school administrators understand the impact of SMIS on school performance. Secondly, they will be able to review the challenges of SMIS adoption and address the ones affecting them before adopting SMIS. Thirdly schools will be able to upload data already captured in SMIS into The National Education Management Information System (NEMIS) to avoid repetition of data capture into the NEMIS system.

Policy makers in the government of Kenya will find very crucial information from the findings of this research, since they are keen on student enrolment for capitation reasons. Since it provides a useful criterion to direct their research endeavors, the study is crucial to both current and future researchers and scholars. The report also identifies research gaps that future scholars may be interested in attempting to solve.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter is centered on previous studies related to the current research topic. The theoretical framework, school management information system adoption, empirical studies, summarized research gaps, literature review and conceptual framework are the key areas of attention in this chapter.

2.2 Theoretical Review

Three theories, including the technology-organization-environment theory and goal setting theory, serve as the foundation for this study.

2.2.1 Diffusion of Innovation Theory

Rogers first proposed this theory in 1962, and it was later improved. It explains how a creative notion gains traction and expands over time via social platforms. As a result of the growth of this idea, institutions will embrace a new inventive concept, such as electronic policing, that is connected with specific benefits, leaving behind the social platform. The ultimate outcome of the adoption process is that an institution does something different than usual, such as using a different service delivery approach. Rogers (2003) goes on to say that for diffusion to occur, a person must regard the new concept, action, or procedure as innovative and as having the potential to improve present public service delivery methods. The diffusion process, according to Srivastava and Morelan (2012), has four important elements: the firm prevailing condition of interaction across policing agencies, the time factor, the routes through which the notion of innovation will be transmitted and the concept of innovation itself.

As a result, according to the theory, the adoption of an innovation technique will be predicated on its ability to produce clear and consistent findings that other measures of innovation may not be

able to provide (Greenhalgh, 2004). Adoption, implementation and diffusion of innovative techniques will result in the use of innovations in SMIS, which is one of the tenets that assimilation of technology has brought forth (Hager, 2006). Consequently, the theory is pertinent to the study since when compatibility, relative advantage and convenience issues, which the theory stipulates to influence the implementation of school management information system are addressed, then the technology will improve performance of secondary schools.

2.2.2 Technology-Organization-Environment Theory

The three SMIS factors that affect technology adoption are the operational, environmental and technical based on this theory introduced by Tornatzky and Fleischer (1990). The technical aspect consists of cutting-edge organizational tactics from both inside and outside the company (Zhu, Kraemer & Xu, 2002). The technical underpinning for SMIS initiatives in Kenya includes budgetary considerations and technological proficiency (Namisiko, et al., 2014).

The organizational structure takes into account the effectiveness of human resources, institution creativity, corporate culture, and top-level managerial support (Awa et al., 2012). The environmental background, on the other hand, includes factors such as organizational partners for instance sponsors, population, and competitive pressure. These will aid secondary schools in determining their innovative needs, their ability to obtain innovative tools and their ability to successfully make use of them (Angeles, 2013).

The theory is relevant in this study on the aspect that understanding the environmental context, the operational context and the technical context factors that promote or hinders implementation of SMIS will enhance consideration of various factors in SMIS implementation. SMIS requires implementation of a wide framework for effective and efficient implementation process. As a

result, technical, environmental and organizational factors play a critical task in the phases of SMIS implementation.

2.2.3 Goal setting theory

A motivational theory called goal setting theory (GST) discusses how goals and task performance are related (Locke & Latham, 2002). GST was formed through an inductive method that evaluated empirical data in areas such as education, business, health, public policy, sports, and fitness (Locke & Latham, 2013). Based on the provisions of the GST, it is evident therefore that giving considerations to the management and stakeholders of secondary schools' ability, goal commitment, task complexity, feedback and task knowledge and resources can really enhance SMIS goals which will result to performance. Having performance setting in education sector particularly secondary schools is important for monitoring the extent at which progress is achieved based on appraisal results. In addition, having a platform that enhances efficiency and effectiveness of operations for instance SMIS could result to achievement of the goal set by the secondary school management.

2.3 School Management Information System Adoption

SMIS is an innovation tool that is essential to operational activities within the scope of educational and non-educational framework (Wei et al., 2016). Schools can effectively maintain records of students' data, to include registers, examination scores and grades, fees payment details, medical record, demographics and appraisals. Furthermore, SMIS also plays a critical role in maintaining procurement records thus improving supplier relationship. Laudon and Laudon (2015) opined that within the framework of SMIS, various dimensions or constructs are practiced. These include, database management, sub-system integration, processing of information, information

dissemination among others. The present study thus concentrates on these major dimensions as the constructs of SMIS.

2.3.1 Database Management

A database management system (DBMS) is a system program for creating and maintaining databases that is a part of MIS (Basilaia & Kvavadze, 2020). Since the DBMS manages all requests, end users and software programs are not needed to comprehend the actual location of the data or the kind of storage media it resides on. On the other hand, Gejir (2017) proposed that programmers won't need to update apps simply because there is a change in the database as long as applications utilize the DBMS's application programming interface (API) for the database. In secondary school, database management is an essential component that enhances data storage, data protection and recovery. As a component of MIS, Cash (2015) opined that DBMS facilitates easy retrieval and evaluation of student performance hence creates an avenue for corrective measures among students as far as performance tracking is concerned.

2.3.2 Sub-System Integration

System integration is the linking of various subsystems into a bigger system that acts as a single source of information (Narindro et al., 2020). System integration is often defined as the process of associating disparate IT systems, and/or software to enable them to work together seamlessly in software solutions. System integrations are often done in any of the four ways (Elhoseny, Metawa, & Hassanien, 2016): common data integration, horizontal integration, vertical integration or star integration (Yahya & Wijoyo, 2020). When sub-systems are connected via point-to-point links, this is known as star integration. Above all, this improves the functionality of the system. One

important disadvantage of this connectivity is that as the number of systems grows, so does the number of integrations. As a result, managing the integrations becomes complex.

Common Data Integration allows systems to bypass the need for the adapter to translate between application formats. Systems that use this strategy either define a standard or app-neutral data format or offer a service that translates data from one application to the common format (Sin & Muthu, 2015). This aims to connect company and organization IT systems so they may communicate with one another. This minimizes operational costs while also speeding up information flow. System integration, according to Coronel and Morris (2016), is used not only to link an organization's internal systems, but also to integrate third parties with whom it does business.

Similarly, in secondary schools, system integration helps the management to synchronize student data in regard to academic performance, co-curricular activities and fees payments integrated with mobile money or banking systems). All these aspects in one place helps determine student progress in all dimensions. In this regard, student information is kept in one data base with various disciplines referred to as network in MIS hence convenient flow of information (Wei et al., 2016).

2.3.3 Processing of Information

Processing is the automated review of a set of records as opposed to the manual review of each transaction (Zhang, Wang & Duan, 2016). It facilitates information processing in terms of speed, accuracy and quality. In the education sector, processing helps in computation of examination marks, fees payment, borrowed library books that are overdue and other related transactions that are interconnected to an individual student. Processing also enables the human resource department to process the monthly payroll. Whereas in the past, university employees would set

aside a few days a week to review files, processing can now be completed daily with little assistance, giving students feedback almost immediately. Automated processing makes it possible to manage employee payroll, student information, fees payment, human resource data and more, giving staff members more time and resources to concentrate on their clients (Safavi-Naini, 2022).

Prior to real time processing and online self-service, students had to call in to find out if their admissions materials had arrived and the entire process may take weeks (Coronel & Morris, 2016). Quality control is the only sector that may need human intervention, ensuring that the admissions details are correct before the package is transferred to the accepted state (Sin & Muthu, 2015). The Bursar's office is in charge of charging students for their tuition and fees. Multiple procedures were previously conducted in order and with suitable dependencies to generate accurate billing files (Gejir, 2017). Previously, the full billing process flow took an entire day to complete. Staff can devote their attention to students and refining company procedures in order to better satisfy their needs. Automated processing allows organizations to run a series of procedures outside of business hours to update large student financial data in a timely and accurate manner (Basilaia & Kvavadze, 2020).

2.3.4 Information Dissemination

Various types of information are disseminated among human civilizations, especially thanks to the readily available communications devices and networks (Zhang, Wang & Duan, 2016). These information will range in importance, such as confidential, sound-sensitive, and public information in scope (Safavi-Naini, 2022). Teachers in schools can contact parents via bulk sms module or bulk email and use the management system interfaces through laptops to promote communication through the information dissemination dimension (Mavellas, Wellington & Samuel, 2015). The

importance of MIS in obtaining, utilizing and sharing information necessitates the enhancement of ICT frameworks in institutions.

2.4 Drivers of SMIS Adoption

Being ICT aware is one of the aspects that provides a suitable practice guide for ICT adoption and implementation (Gregor et al., 2004). Organizations that are cognizant of ICT use a variety of particular ICT management techniques and gain from the organizational learning and change that comes with ICT adoption and deployment. Being receptive to organizational transformation is the second aspect; organizational transformation must be acknowledged as an essential companion to the adoption and deployment of ICT. Activities like the incorporation of ICT into current business processes and the learning of new ICT skills are examples of activities that present transformational opportunities for an organization. Organizations that derive the greatest value from ICT make use of these new capabilities to restructure corporate operations and open up fresh revenue streams.

Technology that can be tested will be embraced more quickly than concepts that cannot. Roger and other researchers (Singh 1966; Fliegel & Kivlin 1966; Roger himself) back up the assertion that trialability is directly and positively correlated with the pace of technological adoption (Sendecka, 2006). The degree to which an innovation's results are evident to others is referred to as being observable (Rogers 1983). The innovation will be adopted more quickly the more widely it is known to others. According to Rogers (1983), these five characteristics account for 49 to 87 percent of the variation in adoption rates. Except for complexity, all five of the elements that influence how quickly innovations are adopted will have a positive, direct impact on that rate, according to Rogers (1983). Other technology drivers include efficient communication with customers, streamlining workflow, business process automation, competitive advantage,

transparency and accountability, technological opportunity, government requirement, request from top management, electronic procurement of suppliers, status gain, organization control and affordability. Rogers claims that complexity has a negative relationship with technology adoption. However, only relative benefit, compatibility and complexity were consistently linked to adoption decisions, according to Tornatzky and Klein (1982) and Sendekka et al (2003). Additionally, wireless networks remove users from the restrictions that have kept them confined to their desks, allowing them to live and work in more flexible and convenient ways (Kumar & Zhan, 2003). According to Kippenberger, there has been substantial expansion in the market for mobile technologies in recent years (Kippenberger, 2000).

2.5 Challenges of SMIS Adoption

Several challenges are an issue for organizations in the path of technology adoption. Lack of sufficient E-commerce knowledge and skilled employees that are able to perceive its benefits, leads to lagging in the implementation of the e-commerce processes successfully (Seyal & Rahman, 2003). Lack of understanding of the needs and necessity of ERP is one of the challenges and influencing factors in its acceptance and implementation (Al-Fawaz et al, 2010).

The difficulties with adoption are closely tied to the general attitude of the workforce, financial limitations, and internal organizational traits. The older staff don't want to alter because they feel much more at ease with standard procedures (Ayedee & Kumar, 2020; Kumar & Ayedee, 2019). At the organizational level, adoption obstacles are also a result of the budgetary restrictions in addition to the mood. The major obstacles to using technology are language difficulties, lack of energy, lack of practice to perfect skills (Richardson J. W., 2011). Other challenges with technology adoption include executive comfort with new technology on the internal level,

unwillingness for creativity and innovation and issues with confidentiality, lack of finances, complexity of systems, hardware incompatibility and fear of failure.

2.6 Performance of Secondary Schools

How successfully a student, educator, or organization has accomplished their immediate and strategic objectives is referred to as "school performance" (Ward, Howard & Murray-Ward, 1996).

Academic success, on the other hand, refers to the accomplishment of milestones in education like high school diplomas and undergraduate degrees, while academic success is a gauge of a student's ability across a variety of courses (Chingos, 2018). To gauge students' progress over time, teachers and education authorities commonly look at classroom performance, graduation rates, and test scores.

School administrators may make more efficient decisions if they have access to accurate and up-to-date information (Martins et al., 2019). Measurement of performance in a school set-up will therefore include increased student enrollment, higher student attendance rate, improved academic excellence, quality teaching, higher social media engagement, increased profit, student discipline, customer satisfaction, land infrastructure development, stakeholder satisfaction, accurate disclosure of financial position, real time data collection and excellence in non-academic activities. As a result, school performance is an extremely important factor (Karanja, 2018).

2.7 Empirical Review

Several studies on ICT implementation and performance in the education sector have been conducted. Wanjala (2015) investigated the usage of ICT in public schools. The study's goal was to discover how teachers felt about the availability of ICT tools, how often they used them, and the consequences of doing so. According to the study's results, the majority of participating

instructors indicated that adopting ICT has transformed their administrative job since it has helped them to save resources.

Ngugi (2012) did a study in the Naivasha District to determine how much ICT is used in education administration. The study recommended that the government install ICT facilities in schools to make it easier to utilize ICT for school administration, as well as training programs to educate individuals how to use ICT for school administration. The findings imply that further study should be conducted on the challenges associated with adopting ICT in secondary schools in other areas.

A study was done by Mutisya et al. (2017) to ascertain how much ICT has been integrated into public secondary school administration in Kitui County, Kenya. According to the interviews, several administrators used ICT in school management, particularly when communicating with parents, students, suppliers and staff members. The study advocated for more ICT usage in public secondary schools. This compares to Etudor-Eyo et al. (2011) and Juma, et al., (2016) who showed how ICT significantly improved the performance of school administrators. The findings imply that university administrators should invest in additional ICT technologies to ensure that education is administered as effectively and efficiently as feasible.

2.8 Summary of Literature and Research Gaps

From the literature review and empirical studies, it can be hypothesized that SMIS has a positive association with performance. Studies conducted in a number of nations have shown that SMIS improve management and organizational effectiveness. Decision-making at schools that employ SMIS can become more effective, according to the studies done. School administrators believe that SMIS contribute to significant changes at their schools, according to the literature. This application, according to school administrators, has raised educational standards, helped with

control and strategy decisions. The function of school administrators has been significantly altered by information technology.

According to the literature, any manager ignoring information technology use is no longer capable of doing his or her job adequately. Finally, Narindro et al. (2020) found that in the efficient use of technology in institutions, school leaders' technology management is more significant than their background. Even though there are many studies on the value of IT education, majority of them focus on the educational functions of information systems, with only a few focusing on school performance. To put it another way, while many studies have been conducted on the function of information systems in the classroom, very few studies have been conducted on their usage in the overall school performance dimension, not necessarily on student performance.

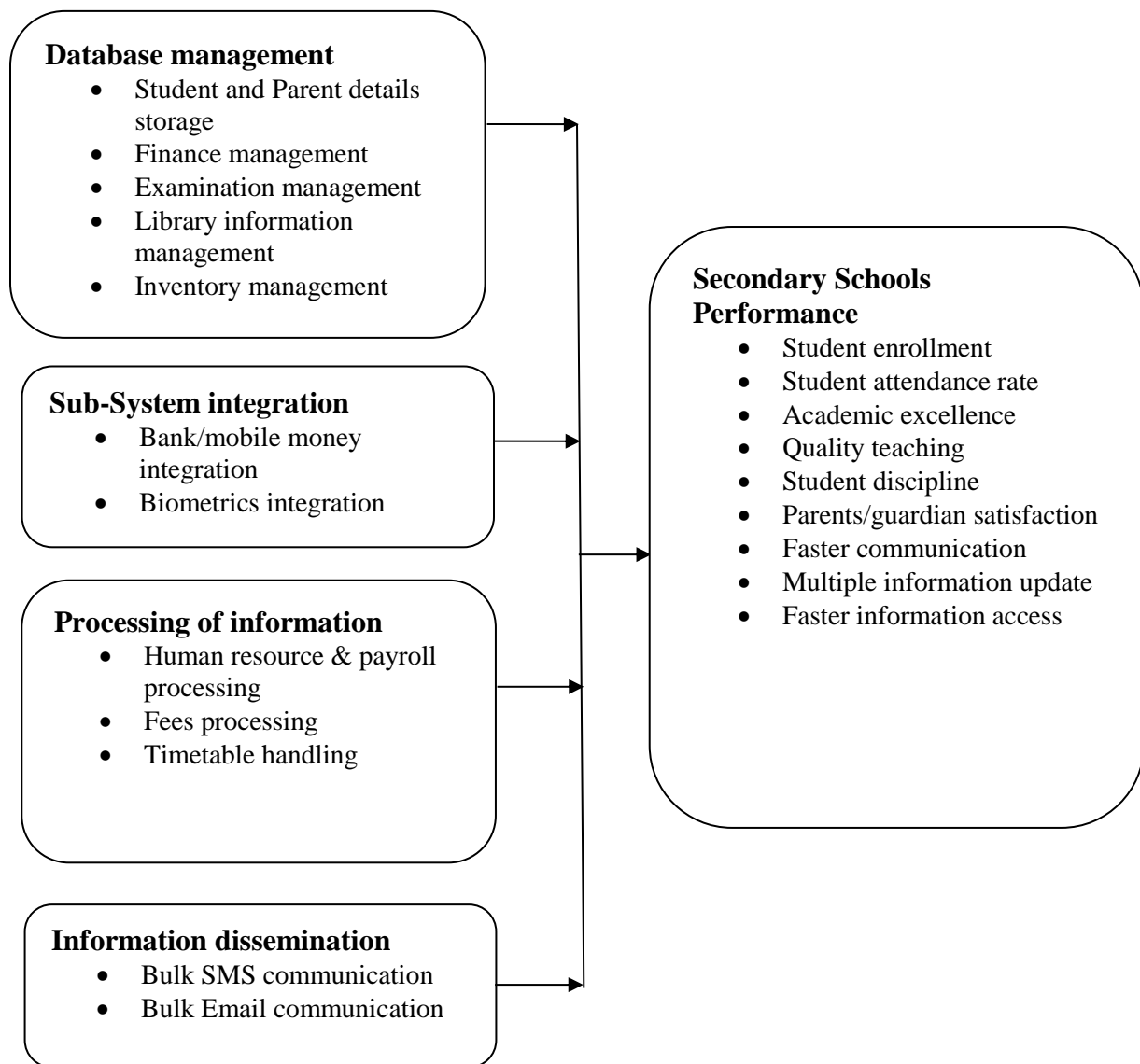
It is evident that information technology and communication is growing in educational activities. Despite the fact that several studies on the effect of information systems on learning have been conducted, few studies have been done on the use of them in general school performance dimension and not necessarily on student performance. These studies have not also factored in School Management Information System (SMIS) as a construct of information communication technology. Consequently, the goal of the current research is to close this gap by considering SMIS and its effect on school performance. To enhance the understandability of the variables in question, the study will narrow down to four aspects of SMIS; database management, information sharing, subsystem integration and processing.

2.9 Conceptual Framework

A conceptual frame work is an important technique for diagrammatically presenting the relationships between variables under examination (Mugenda, 2012). The purpose of the current

study is to determine how secondary school performance and SMIS are related. School management information system is measured using four constructs; database management, information dissemination, subsystem integration and processing. Therefore dimensions are considered as independent variables while performance of secondary schools considered as dependent variable. Figure 2.1. presents this relationship.

Figure 2.1. Conceptual Model



Source: Researcher (2022)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The method that will be used to conduct the analysis in order to achieve the objectives of the study is covered in this chapter. The research design, study population, sample size, data collection and data analysis are all covered in this section.

3.2 Research Design

A descriptive research design methodology was used in this study. Descriptive survey designs are used to learn about the general features of a certain group or subjects (Gill & Johnson, 2006). In order to compare the condition to the corresponding target group, it also helps in establishing a person's real perceptions and ideals. This research approach was appropriate for this analysis because it allowed the researcher to make judgments about how the performance of secondary schools is affected by SMIS.

3.3 Population of the Study

In the words of Hancock and Algozzine (2016), a study population is a group of research elements that a researcher has developed an interest in studying while conducting a certain hypothesis. These components may be live or non-living things. The target population of study is chosen depending on a variety of considerations such as geographical limitations of study scope, availability of resources and time constraints. The entire study population was 252 secondary schools in Nairobi country.

3.4 Sampling

In the study's design, purposive sampling was deployed, where the researcher chose a representative sample based on their needs. From each of the secondary schools in Nairobi County, the researcher purposively chose one representative from the school administration. The

representatives were directors, principals, deputy principals, senior teachers, teachers and bursars. This was because the subjects are managers in their individual offices, and as a result, were thought to have a wealth of information and provide accurate responses to the study (Kombo and Tromp, 2004). The sample size was 75 schools.

$$N=\text{Target Population (252)} \quad n=\text{Sample size (30\%)} \quad (N*n)/100$$

$$=(252*30)/100 = 75 \text{ Schools}$$

3.5 Data Collection

Primary data was gathered via a questionnaire. There were five parts of the questionnaire. The demographic details of respondents and the secondary schools were covered in Section A, while Section B aimed to collect data in relation to adoption of SMIS. Data collection on drivers of SMIS adoption would be collected in Section C. Section D aimed to collect data on challenges of SMIS adoption. Finally Section D sought to determine the relationship between SMIS and secondary schools performance in Nairobi County. The questionnaires was administered online.

3.6 Data Analysis

For precision, clarity and completeness, the questionnaire was revised, after the data that was needed had been obtained. To allow statistical analysis, the responses were coded into numerical form. Demographic data was presented using frequency and percentage. The extent of adoption was presented using mean and standard deviation. Data on drivers of adoption plus challenges faced during adoption was analyzed using mean (\bar{X}) and standard deviation (σ).

To determine the relationship between SMIS and performance of secondary schools, a regression equation was established. The regression took the following form;

$$\text{Secondary School Performance} = f(x_1, x_2, x_3, x_4)$$

More specifically, the regression was of the form;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where Y = Performance in Secondary School

β_0 = Constant

X_1 = Database management

X_2 = Subsystem integration

X_3 = Information dissemination

X_4 = Information Processing

ϵ = Error term

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The purpose of the study was to determine the connection between SMIS adoption and performance of secondary schools in Nairobi County. This chapter presents the analysed data as well as its interpretation.

4.2 Response Rate

The study aimed to gather information from 75 secondary private and public schools in Nairobi County. From a total of 75 schools targeted for the study, 71 schools took part in the study, presenting a 94.6% response rate. A response rate of 5.4% was recorded of schools who did not participate in the study. According to Bryman and Bell (2014), an adequate response rate is fifty percent, an acceptable rate is sixty percent, and a response rate of seventy percent or more is excellent. As a result, the participation degree in this research was quite high.

4.3 Demographic Profile of the Study Respondents

The features of the schools and the school representatives were crucial to this study since they made it possible to identify the differences among them and determine how they would influence the findings. Some of the demographics taken into account for this study include age, gender, highest education level, job position, work duration in the school, student population, staff population, age of the school, school type, nature of the school and category of the school.

4.3.1 Gender of the Respondents

Gender was regarded as a critical factor in this study in relation to SMIS adoption since different gender perceive things differently. Male respondents totalled to 54.9% while female respondents totalled to 45.1%. This means that majority of the schools were represented by male respondents. They comprised the majority of respondents, which may help to explain that they had a direct

involvement in the institution's adoption of SMIS. Table 4.1 presents the results obtained from this study.

Table 4.1. Gender of the Respondents

Gender	Frequency	Percentage
Male	39	54.90%
Female	32	45.10%
Total	71	100%

4.3.2 Age of the Respondents

Age is another significant factor taken into account in this study because it contributes to the respondents' various experiences and opinions. It is stated that taking into account a person's age group might help examine different people's opinions effectively. Majority of respondents 23(32.45) were aged between 30 and 39. After that, the 50 and above age group followed with a total of 21(29.6%). Respondents below 30 years were the minority, with a count of 8(11.3%). The results were displayed in Table 4.2.

Table 4.2. Age of the Respondents

Age Bracket	Frequency	Percentage
Below 30 years	8	11.30%
30-39	23	32.40%
40-49	19	26.80%
50 years and above	21	29.60%
Total	71	100%

4.3.3 Highest Level of Education

From the findings presented on table 4.3 it is evident that most respondents 34(47.9%) selected for the study have attained a bachelor's degree. 20(28.2%) respondents had attained a masters' degree,

10(14.1%) had a diploma, 2(2.8%) had a certificate. A similar frequency of 2(2.8%) had a PhD, while 1(1.4%) had a postgraduate diploma, 1(1.4%) CPA(K) and 1(1.4%) had a higher diploma.

Table 4.3. Highest Level of Education

Education	Frequency	Percentage
Certificate	2	2.80%
Diploma	10	14.10%
Bachelors	34	47.90%
Masters	20	28.20%
PhD	2	2.80%
Postgraduate Diploma	1	1.40%
CPA (K)	1	1.40%
Higher diploma	1	1.40%
Total	71	100%

4.3.4 Current Position in the School

Current position results were presented in the below table 4.4 which shows that teachers were the largest respondents. This is because of their availability and their large numbers in the schools. A total of 16(22.5 %) teachers responded. This was followed by 13(18.3%) senior teachers. The next group of 11(15.5%) respondents were the principals, followed by 9(12.7%) directors. The deputy principals were 5(7%) then the bursars were 2(2.8%). Bursars and the IT technicians' respondents were the same number. In three different schools, 1(1.4%) school counselor, 1(1.4%) learning coordinator and 1(1.4%) librarian responded.

Table 4.4. Current Position in the School

Current Position	Frequency	Percentage
Director	9	12.70%
Principal	11	15.50%
Deputy principal	5	7%
Senior teacher	13	18.30%
Teacher	16	22.50%
Bursar	10	14.10%
Counsellor	1	1.40%
Learning Coordinator	1	1.40%
Librarian	1	1.40%
IT technician	2	2.80%
Accounts Clerk	2	2.80%
Total	71	100%

4.3.5 Working Duration in the School

The tabulation in the below table 4.5 indicate that most of the school respondents 28(39.4%) have work experience in their schools between 9 and 14 years. This was followed by 26(36.6%) respondents who have worked between 3 and 8 years. 9(12.7%) respondents have worked for less than 3 years while 8(11.3%) respondents have worked for 15 years and above.

Table 4.5. Work Duration in the School

Work Duration	Frequency	Percentage
Below 3 years	9	12.70%
3-8 years	26	36.60%
9-14 years	28	39.40%
15 years and above	8	11.30%
Total	71	100%

4.3.6 Student Population

The schools selected their student population bracket. Table 4.6 shows that most schools using SMIS in Nairobi county have a population of 601 to 800 students.

Table 4.6. Student Population

Student Count	Frequency	Percentage
200 or less	7	9.90%
201-400	13	18.30%
401-600	6	8.50%
601-800	15	21.10%
801-1000	11	15.50%
1001-1200	11	15.50%
1201-1400	5	7%
1401 and above	3	4%
Total	71	100%

4.3.7 Employees in the School

From table 4.7 most schools had 21 to 40 employees and 41 to 60 employees and the count was 19(26.8%). 8(11.3%) schools had employees above 100. No school had an employee count between 81 and 100.

Table 4.7. Employees in the School

Employee Count	Frequency	Percentage
0-20	14	19.70%
21-40	19	26.80%
41-60	19	26.80%
61-80	11	15.50%
81-100	0	0%
Above 100	8	11.30%
Total	71	100%

4.3.8 Age of the School

Every school indicated how long they had been in existence. From table 4.8 most schools with a count of 25 (32.50%) had been in existence between 11 and 20 years, 16 (22.5%) were 10 years old or less, 13 (18.3%) were over 40 years old, 10 (14.1%) were between 31 and 40 years old while 7 (9.9%) were between 21 and 30 years old. According to Table 4.8, the outcomes

Table 4.8. Age of the School

School Age	Frequency	Percentage
10 years or less	16	22.50%
11-20 years	25	32.50%
21-30 years	7	9.90%
31-40 years	10	14.10%
Over 40 years	13	18.30%
Total	71	100%

4.3.9 School Type

The schools were requested to indicate whether they were private or public. 37 (52.1%) of the schools were public while 34 (47.9%) were private secondary schools. The findings are as displayed in table 4.9 below.

Table 4.9. School Type

School Type	Frequency	Percentage
Private	34	47.90%
Public	37	52.10%
Total	71	100%

4.3.10 Nature of the School

The schools were to state if boarding, day, or both. 30 (42.3%) of the schools were day, 28 (39.4%) were boarding while 13 (18.3%) were day/boarding schools. The outcome is shown in Table 4.10.

Table 4.10. Nature of the School

Nature of the School	Frequency	Percentage
Day	30	42.3%
Boarding	28	39.4%
Day/boarding	13	18.3%
Total	71	100%

4.3.11 Category of the School

The respondents were requested to indicate whether the school is mixed school, boys school or girls school. From Table 4.11 most 31 (43.7%) of the schools were mixed schools, 21 (29.6%) were girls school while 19 (26.8%) were boys schools. Table 4.11 show the outcome.

Table 4.11. Category of the School.

School Category	Frequency	Percentage
Mixed school	31	43.7%
Boys school	19	26.8%
Girls school	21	29.6%
Total	71	100%

4.4 Extent of SMIS Adoption among Secondary Schools in Nairobi County

A study on extent of SMIS adoption among secondary schools in Nairobi county was conducted.

4.4.1 Extent of Adoption of SMIS

The respondents were asked to identify SMIS functionalities that had been adopted for operation in the school. The findings are displayed in Table 4.12.

Table 4.12. Extent of Adoption of SMIS

Module/Function	Mean	Std. Dev
Database management	3.93	0.897
Finance management	3.89	1.253
Student and Parent details storage	3.93	0.897
Examination management	3.91	0.928
Library information management	3.57	0.835
Inventory management	3.57	0.878
	3.8	0.948
Sub-System integration	3.76	1.103
Bank / Mobile money integration	3.73	1.341
	3.745	1.222
Information processing	3.72	1.332
Human Resource and Payroll management	3.86	1.280
Fees Processing	3.60	0.925
Timetable handling	3.52	0.938
	3.675	1.119
Information dissemination	3.66	1.094
Bulk SMS communication	3.70	1.037
	3.68	1.066

From the results, the respondents strongly suggested that SMIS has been adopted for management of records (mean=3.8), followed by sub-system integration (mean=3.745), information dissemination (mean=3.68) and information processing (mean=3.675). Under management of records, student and parent details storage was the most adopted module (mean=3.93), while timetable handling was the least adopted module (mean=3.52). This illustrates to a great extent that SMIS has been adopted for management of records.

4.4.2 Length of Use of SMIS

In their responses, the schools were asked how long they had adopted SMIS. From the findings, 24 (33.8%) indicated the SMIS was in use for a duration of 4 to 6 years, 19 (26.5%) indicated 1 to 3 years, 16 (22.1%) indicated 7 to 9 years. Table 4.13. displays these outcome.

Table 4.13. Length of Use of SMIS

School Type	Frequency	Percentage
1 – 3 years	19	26.5%
4 – 6 years	24	33.8%
7 – 9 years	16	22.1%
9– 11 years	9	13.2%
11-13 years	2	2.9%
Over 13 years	1	1.5%
Total	71	100%

4.5 Drivers of SMIS Adoption Among Secondary Schools in Nairobi County

A study on drivers of SMIS adoption among secondary schools in Nairobi county was conducted.

4.5.1 Extent of School Motivation to Adopt SMIS

It was requested of the respondents to describe the circumstances under which different motivating elements led the school to adopt SMIS. Table 4.14. show the drivers of SMIS adoption

Table 4.14. Extent of School Motivation to Adopt SMIS

Driver	Mean	Std. Dev
Efficient communication with parents	3.87	0.753
Streamlining workflow	3.52	1.283
Business process automation	3.55	1.140
Competitive advantage	3.70	0.755
Transparency and accountability	3.61	1.206
Technological opportunity	3.65	1.356

Government requirements	3.75	1.304
Request from top management	3.86	1.426
E-procurement of supplies	3.62	0.954
School status gain	3.66	1.363
Location of the school	3.72	1.021
Organizational control	3.82	1.109
Affordability of the system	3.79	1.081

The results, according to the schools, significantly suggest that efficient communication with parents motivated the school to adopt SMIS (mean=3.87), followed by request from top management (mean=3.86), organizational control (mean=3.82), affordability of the system(mean=3.79), government requirements (mean=3.75), location of the school (mean=3.72), competitive advantage (mean=3.7), school status gain (mean=3.66), technological opportunity (mean=3.65), e-procurement of supplies (mean=3.62), transparency and accountability (mean=3.61), business process automation (mean=3.55), and streamlining workflow (mean=3.52). This illustrates to a great extent that efficient communication with parents motivated the school to adopt SMIS.

4.6 Challenges in SMIS Adoption Among Secondary Schools in Nairobi County

A study on challenges encountered during SMIS adoption among secondary schools in Nairobi county was conducted.

4.6.1 Extent of Challenges in Adopting SMIS

The schools were asked to specify the degree to which they had faced different challenges in adopting SMIS. The extent of challenges findings are displayed in Table 4.15.

Table 4.15. Extent of Challenges in Adopting SMIS

Challenge	Mean	Std. Dev
Lack of finances	3.55	1.012
Lack of skilled labour	3.61	1.272
System complexity	3.52	1.145
Lack of leadership in the school	3.83	0.938
Insufficient system training	3.78	0.835
Skilled employee turnover	3.96	0.888
Management system insecurity	3.87	0.973
End user resistance to technology	4.06	1.027
Fear of system failure	4.2	0.769
High system cost	4.04	0.972
Hardware incompatibility	4.13	0.723
Language barrier	4.09	0.921
Poor internet access	3.88	0.881
Government demanding policies	3.90	1.201
Poor school infrastructure	3.72	0.721

The results, to a great extent suggest that fear of system failure was the main challenge the school faced in adopting SMIS (mean=4.2), followed by hardware incompatibility (mean=4.13), language barrier (mean=4.09), end user resistance to technology (mean=4.06), high system cost (mean=4.04), skilled employee turnover (mean=3.96), government demanding policies (mean=3.9), poor internet access (mean=3.88), management system insecurity (mean=3.87), lack of leadership in the school (mean=3.83), insufficient system training (mean=3.78), poor school infrastructure (mean=3.72), lack of skilled labour (mean=3.61), lack of finances (mean=3.55), and system complexity (mean=3.52). This illustrates to a great extent that fear of system failure was the main challenge the school faced in adopting SMIS.

4.7 Relationship Between SMIS Adoption and Performance

An investigation into the relationship between performance of secondary schools in Nairobi county and SMIS adoption was conducted.

4.7.1 Extent of Performance After SMIS Adoption

The respondents were requested to describe how well the school has performed after SMIS adoption according to various measures of performance.

Table 4.16. Extent of Performance After SMIS Adoption

Performance	Mean	Std. Dev
Student enrollment	4.27	0.1324
Student attendance rate	4.22	0.1632
Academic excellence	4.34	0.1002
Quality teaching	3.99	0.1125
Higher social media engagement	4.14	0.1324
Student discipline	4.22	0.1976
Customer satisfaction	4.14	0.1189
Accurate disclosure of financial position	3.97	0.1128
Real time data reconciliation	4.39	0.1238
Land infrastructure development	4.18	0.1802
Faster communication	3.90	0.1492
Faster information access	3.86	0.1720

The results, to a great extent suggest that real time data reconciliation has improved after SMIS adoption (mean=4.39), followed by academic excellence (mean=4.34), student enrollment (mean=4.27), student attendance rate (mean=4.22), student discipline (mean=4.22), land infrastructure development (mean=4.18), higher social media engagement (mean=4.14), customer satisfaction (mean=4.14), quality teaching (mean=3.99), accurate disclosure of financial position

(mean=3.97), faster communication (mean=3.9), and faster information access (mean=3.86). This illustrates to a great extent that Real time data reconciliation has improved after SMIS adoption.

4.7.2 Performance Improvement

The respondents were requested to rate performance improvement after adoption of SMIS. From the findings majority indicated that performance had improved after adoption of SMIS. Table 4.17. displays the results.

Table 4.17. Performance Improvement After SMIS Adoption

Ratings	Frequency	Percentage
Below 10%	3	4.2%
11-20%	3	4.2%
21-30%	0	0%
31-40%	1	1.4%
41-50%	4	5.6%
51-60%	7	9.9%
61-70%	15	21.1%
71-80%	19	26.8%
81-90%	14	19.7%
91-100%	5	7%
Total	71	100%

4.8 Regression Analysis

To determine the correlation between the predictor factors and secondary school performance in Nairobi County, the study used multiple regression analysis. After cleaning and coding field data, the results of the regression statistics were produced by the study using SPSS version 24. The alteration of the dependent variable can be used to explain the alteration of the independent variables, according to the coefficient of determination. For the current study, performance of

secondary schools in Nairobi county served as the dependent variable while the predictor factors were database management, sub-system integration, processing of information, and information dissemination.

4.8.1 Model Summary

The correlation between performance of secondary schools in Nairobi County and the predictor factors is summarized by the model in the table below.

Table 4.18. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	P-value
1	0.89	.792	.742	.312	31.341	.001

a. Predictors: (Constant), database management, sub-system integration, processing of information, and information dissemination.

b. Dependent Variable: Performance of secondary schools in Nairobi County

Source: Primary Data (2022)

As per the results in the table, the independent variable in the model clarifies 79.2% of the variation in secondary school performance in Nairobi County, or $R^2=0.792$. However, other unrepresented drivers in the regression model are to blame for the 20.8% unexplained varying levels of performance of secondary schools in Nairobi County. The findings in the table above show that the model is sound and suitable for estimate. According to the data in the table, a substantial association between the predictor factors and the performance of secondary schools in Nairobi County was found. This relationship is shown by the variables as shown by $R^2=0.792$, which is 79.2%.

4.8.2 ANOVA Results

The relationship between the secondary school performance and the predictor variables as determined by an ANOVA are shown in Table 4.19.

Table 4.19. ANOVA of the Regression

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.015	4	5.754	8.781	.000 ^b
	Residual	43.23	66	.655		
Total		66.245	70			

a. Predictors: (Constant), database management, sub-system integration, processing of information, and information dissemination.

b. Dependent Variable: Performance of secondary schools in Nairobi County

Source: Primary Data (2022)

The model's predictive power is statistically significant on how the factors (database management, sub-system integration, processing of information, and information dissemination) impact secondary schools performance in Nairobi County, since the significance value is 0.000, which is less than 0.05. At a 5% significance level, the F critical value was 3.123. This demonstrates that the entire model was significant because the estimated F is higher than the F critical (value = 8.781).

4.8.3 Coefficient of Determination

Table 4.20 shows the coefficient of determination results.

Table 4.20. Coefficient of Determination

	Unstandardized		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta	T	Sig.
Model 1 (Constant)	0.288	0.115		2.491	0.005
Database Management	0.319	0.121	0.514	2.61	0.001
Sub-System Integration	0.286	0.118	0.451	2.44	0.002
Processing of Information	0.243	0.106	0.413	2.32	0.001
Information Dissemination	0.225	0.095	0.398	2.35	0.001

a. **Dependent Variable:** Performance of secondary schools in Nairobi County

Source: Primary Data (2022)

The regression equation is:

$$Y = 0.288 + 0.319X_1 + 0.286X_2 + 0.243X_3 + 0.225X_4 + \varepsilon$$

The statistics showed that, when all other independent variables are set to zero, an increase in database management will result in a 0.319 increase in secondary school performance in Nairobi County, sub-system integration by 0.286 information processing by 0.243 and information processing by 0.243 increase in performance. This implies that database administration, followed by sub-system integration, contributes most to the secondary schools performance in Nairobi County. Database administration, sub-system integration, information processing, and information dissemination were all significantly correlated with secondary school performance in Nairobi County, with a 95% confidence interval and a significance level of 5%.

4.9 Discussion of Findings

The study, to a great extent suggest that SMIS has been adopted for database management (management of records). The study also found that SMIS was in use for a duration of 4-6 years.

The results, to a great extent suggest that efficient communication with parents motivated the school to adopt SMIS. Being ICT aware is one of the aspects that provides a suitable practice guide for ICT adoption and implementation (Gregor et al., 2004). Organizations that are cognizant of ICT use a variety of particular ICT management techniques and gain from the organizational learning and change that comes with ICT adoption and deployment. The study, to a great extent suggest that fear of system failure was the main challenge the school faced in adopting SMIS. The difficulties with adoption are closely tied to the general attitude of the workforce, financial limitations, and internal organizational traits. The older staff don't want to alter because they feel much more at ease with standard procedures (Ayedee & Kumar, 2020; Kumar & Ayedee, 2019). The study further found, to a great extent that real time data reconciliation has improved after SMIS adoption. As a result, school performance is an extremely important factor (Karanja, 2018).

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

In this chapter, the relationship between secondary school performance in Nairobi County and the implementation of SMIS is summarized, concluded, and suggestions were given.

5.2. Summary of Findings

The results, to a great extent, show that that SMIS has been adopted for database management. The study also found that SMIS was in use for a duration of 4 to 6 years. The study, to a great extent efficient communication with parents motivated the school to adopt SMIS. The study, to a great extent suggest that fear of system failure was the main challenge the school faced in adopting SMIS. The study further found that to a great extent that Real time data reconciliation has improved after SMIS adoption.

The model's ability to forecast how database management, sub-system integration, information processing, and information dissemination impact the performance of secondary schools in Nairobi County was statistically significant, according to the study, which found that the significance value was 0.000, which was less than 0.05. The research also discovered that database management, followed by sub-system integration, had the greatest impact on the performance of secondary schools in Nairobi County. Database administration, sub-system integration, information processing, and information dissemination were all significantly correlated with secondary school performance in Nairobi County at the 5% level of significance and 95% level of confidence.

5.3 Conclusion

The study concluded that to a great extent that SMIS has been adopted for management of records. The study also found that SMIS was in use for a duration of 4 to 6 years. The study concluded that to a great extent that efficient communication with parents motivated the school to adopt SMIS. The study concluded that to a great extent that fear of system failure was the main challenge the school faced in adopting SMIS. The study also concluded that database management contribute the most to performance of secondary schools in Nairobi County, followed by sub-system integration. At 5% level of significance and 95% level of confidence, database management, sub-system integration, processing of information, and information dissemination were all significant on performance of secondary schools in Nairobi County.

5.4 Recommendations

1. The study recommended facilitation of schools to enable purchase of computers and accessories, structured networks and fast internet to enable adoption of SMIS.
2. In addition, the school administration, which consists of secretaries, bursars, principals, and deputy principals, should enroll in computer-related courses to improve and modernize their understanding of SMIS.

5.5 Recommendations for Further Research

In this research, the adoption of SMIS and secondary school performance in Nairobi County were compared. However, secondary school performance and the adoption of SMIS are also influenced by other factors, including location-specific factors and school size. Therefore, it is advised that more study be conducted to discover and look into other variables that influence the adoption of SMIS and performance of secondary schools—not only in Kenya, but also in other countries and regions. To check for replication of the same results, more research should be conducted in other areas. It is necessary to do more study on the same subject with a bigger sample size.

REFERENCES

- Abualoush, S. H., Obeidat, A. M., Tarhini, A., & Al-Badi, A. (2018). The role of employees' empowerment as an intermediary variable between knowledge management and information systems on employees' performance. *VINE Journal of Information and Knowledge Management Systems*.
- Adeniran, T. V., & Johnston, K. A. (2016). The impacts of ICT utilisation and dynamic capabilities on the competitive advantage of South African SMEs. *International Journal of Information Technology and Management*, 15(1), 59-89.
- Baker, J. (2012). The technology–organization–environment framework. *Information systems theory*, 231-245.
- Bharati, P. and Chaudhury, A. (2006), Current Status of Technology Adoption: Micro, Small and Medium Manufacturing Firms in Boston, Communications of the ACM, Vol. 49, No. 10, pp. 88-93.
- Cash, J. A. (2015). School leaders and the implementation of education management information systems (EMIS) in the Bahamas: a case study of six principals (Doctoral dissertation, University of Sussex).
- Chingos, M. M. (2018). What matters most for college completion. Academic preparation is a key predictor of success. AEI Paper & Studies A, 3.
- Coronel, C., & Morris, S. (2016). *Database systems: design, implementation, & management*. Cengage Learning.
- DeStefano, T., Kneller, R., & Timmis, J. (2018). Broadband infrastructure, ICT use and firm performance: Evidence for UK firms. *Journal of Economic Behavior & Organization*, 155, 110-139.
- Elhoseny, M., Metawa, N., & Hassanien, A. E. (2016, December). An automated information system to ensure quality in higher education institutions. In *2016 12th International Computer Engineering Conference (ICENCO)* (pp. 196-201). IEEE.
- Etudor-Eyo, E., Emah, I. E., & Ante, H. A. (2012). The use of ICT and communication effectiveness among secondary school administrators. *EDUCARE*, 4(2).

- Gehlawat, Manju. (2014). School Management Information System: An Effective Tool for Augmenting the School Practices. *New Frontiers in Education: International Journal of Education & Research*, 47, 57-64.
- Karanja, M. (2018). Role of ICT in dissemination of information in secondary schools in Kenya: A literature based review. *Journal of Information and Technology*, 2(1), 28-38.
- Lapiedra, R., & Devece Carañana, C. A. (2012). Introduction to management information systems.
- Laudon, K. C., & Laudon, J. P. (2015). *Management information system*. Pearson Education India.
- Locke, E. A., & Latham, G. P. (1994). Goal setting theory. *Motivation: Theory and research*, 13, 29.
- Locke, E. A., & Latham, G. P. (2012). Goal setting theory. In *Motivation: Theory and research* (pp. 23-40). Routledge.
- Lucas, M., Nelson, J., & Sims, D. (2020). Schools' Responses to COVID-19: Pupil Engagement in Remote Learning. *National Foundation for Educational Research*.
- Luen, A. M. (2012). Strengthening the education management information system (EMIS) in Tanzania: Government actors' perceptions about enhancing local capacity for information-based policy reforms.
- Martin, W. (2020). Effectiveness of Computer Based Instruction on Students' Achievement in Mathematics in Secondary Schools in Kenya. *International Journal of Education and Research*, 8(6), 189-198.
- Munirat, Y., Sanni, I. M., & Kazeem, A. O. (2014). The impact of management information system (MIS) on the performance of business organization in Nigeria. *International Journal of Humanities Social Sciences and Education (IJHSSE)*, 1(2), 76-86.
- Mutisya, A. M., Mwanja, J. M., & Mulwa, D. M. (2017). The influence of school related factors on ICT integration in the management of public secondary schools in Kitui County, Kenya. *European Journal of Education Studies*.
- Narindro, L., Hardyanto, W., Raharjo, T. J., & Kardoyo, K. (2020). Development of accountability for academic performance model based on management information system. *VINE Journal of Information and Knowledge Management Systems*.

- Omokonga, S. (2014). *The Effect of Integrated Financial Management Information System on the Performance of Public Sector Organizations* (Doctoral dissertation, United States International University-Africa).
- Peter, N. G. U. G. I. (2012). An investigation into the extent of the use of ICT in education management in public secondary schools in Naivasha District, Kenya.
- Richardson, J. W. (2011). Challenges of Adopting the Use of Technology in Less Developed Countries: The Case of Cambodia. *Comparative Education Review*, 55(1), 008–029. <https://doi.org/10.1086/656430>
- Rogers, E. M. (1995). Diffusion of Innovations: modifications of a model for telecommunications. In *Die diffusion von innovationen in der telekommunikation* (pp. 25-38). Springer, Berlin, Heidelberg.
- Safavi-Naini, A. (2022). Information dissemination. *Nature Physics*, 18(2), 131-132.
- Soudani, S. N. (2012). The usefulness of an accounting information system for effective organizational performance. *International Journal of Economics and Finance*, 4(5), 136-145.
- Srivastava, J., & Moreland, J. J. (2012). Diffusion of innovations: Communication evolution and influences. *The Communication Review*, 15(4), 294-312.
- Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *Processes of technological innovation*. Lexington books.
- Tummers, J., Kassahun, A., & Tekinerdogan, B. (2019). Obstacles and features of Farm Management Information Systems: A systematic literature review. *Computers and electronics in agriculture*, 157, 189-204.
- Wanjala, A. S. (2015). Teachers' perceptions on the Use of Information Communication Technology in the Administration of Public Secondary Schools in Kimilili District, Bungoma County, Kenya.
- Ward, A., Howard, W., & Murray-Ward, M. (1996). *Achievement and Ability Tests - Definition of the Domain: Educational Measurement*. University Press of America.
- Wei, L. M., Piaw, C. Y., Kannan, S., & Moulod, S. A. (2016). Relationship between teacher ICT competency and teacher acceptance and use of School Management System (SMS). *Malaysian Online Journal of Educational Technology*, 4(4), 36-52.

- Yahya, M., &Wijoyo, H. (2020). Developing School Information Program: Integrated Management System based on Character Value at SMP Negeri 9 Tapung. *International Journal of Asian Education*, 1(3), 179-186.
- Yunus, M. A. M., Krishnan, S. K. G., Nawi, N. M., &Surin, E. S. M. (2017). Study on Database Management System Security Issues. *JOIV: International Journal on Informatics Visualization*, 1(4-2), 192-1

APPENDICES

RESEARCH QUESTIONNAIRE

SMIS is School Management Information Systems

SECTION A (BACKGROUND INFORMATION)

1. **Please indicate your gender?**

Male [] Female []

2. **What age bracket do you fall under?**

Less than 30 years [] 30-39 [] 40-49 [] 50 years and above []

3. **Please indicate your highest level of education?**

Certificate [] Diploma [] Bachelors [] Masters []

Others, specify

4. **What is your current position in the school?**

Director [] Principal [] Deputy Principal [] Bursar []

Senior teacher []

Others, specify

5. **For what duration have you worked in this school?**

Less than 3 years [] 3-8 years [] 9-14 years [] Above 14 years []

6. **How many students does the school currently have?**

200 or less [] 201-400 [] 401-600 [] 601-800 [] 801-1000 []

1001-1200 [] 1201-1400 [] 1401 and above []

7. **How many employees does the school currently have?**

20 or less [] 21-40 [] 41-60 [] 61-80 [] 81-100 []
100 and above []

8. How old is the school?

10 years or less [] 11-20 years [] 21-30 years [] 31-40 years []
Over 40 years []

9. Please tick if the school is public or private institution

- Public []
- Private []
- Others, specify

10. Is the school day or a boarding school or both?

- Day []
- Boarding []
- Both []

11. Is it a mixed school or boys school or girls school?

- Mixed []
- Boys []
- Girls []

SECTION B (EXTENT OF ADOPTION)

12. On a scale of 1-5, please indicate the extent to which SMIS has been adopted for operation in the school according to each of the following functions. Tick using the scale:

Not At All (1), Little Extent (2), Moderate Extent (3),
High Extent (4), Very High Extent (5)

No	Module/Function	Not At All (1)	Little Extent (2)	Moderate Extent (3)	High Extent (4)	Very High Extent (5)
1	Management of records					
2	Subsystem integration					
3	Information dissemination					
4	Information processing					
5	Student and Parent details storage					
6	Examination processing					
7	Fees Processing					
8	Finance management					
9	Bank / Mobile money integration					
10	Library information management					
11	Inventory management					
12	Bulk SMS communication					
13	Human Resource and Payroll management					
14	Timetable handling					
15	Others, specify and rate accordingly.....					

13. For how long has the school been using SMIS?

1 – 3 years []

4 – 6 years []

7 – 9 years []

9– 11 years []

11-13 years []

Over 13 years []

SECTION C (DRIVERS OF ADOPTION)

13. Indicate the extent to which each of the following drivers motivated the school to adopt

SMIS? Tick using the scale:

Not At All (1), Little Extent (2), Moderate Extent (3),

High Extent (4), Very High Extent (5)

No	Driver	Not At All (1)	Little Extent (2)	Moderate Extent (3)	High Extent (4)	Very High Extent (5)
1	Efficient communication with parents					
2	Streamlining workflow					
3	Business process automation					
4	Competitive advantage					
5	Transparency and accountability					
6	Technological opportunity					
7	Government requirements					
8	Request from top management					
9	E-procurement of supplies					
10	School status gain					
11	Location of the school					
12	Organizational control					
13	Affordability of the system					
14	Others, specify and rate accordingly.....					

SECTION D (CHALLENGES OF ADOPTION)

15. On a scale of 1-5, please tick the extent to which the school has faced each of the following challenges in adopting SMIS. Tick using the scale:

Not At All (1), Little Extent (2), Moderate Extent (3),
 High Extent (4), Very High Extent (5)

No	Challenge	Not At All (1)	Little Extent (2)	Moderate Extent (3)	High Extent (4)	Very High Extent (5)
1	Lack of finances					
2	Lack of skilled labour					
3	System complexity					
4	Lack of leadership in the school					
5	Insufficient system training					
6	Skilled employee turnover					
7	Management system insecurity					
8	End user resistance to technology					
9	Fear of system failure					
10	High system cost					
11	Hardware incompatibility					
12	Language barrier					
13	Poor internet access					
14	Government demanding policies					
15	Poor school infrastructure					
16	Others, specify and rate accordingly.....					

SECTION E (PERFORMANCE AFTER ADOPTION)

16. On a scale of 1-5, please indicate the extent to which the school has performed after SMIS adoption according to each of the following measures of performance. Tick using the scale:

Not At All (1), Little Extent (2), Moderate Extent (3),
High Extent (4), Very High Extent (5)

No	Performance	Not At All (1)	Little Extent (2)	Moderate Extent (3)	High Extent (4)	Very High Extent (5)
1	Student enrollment					
2	Student attendance rate					
3	Academic excellence					
4	Quality teaching					
5	Higher social media engagement					
6	Student discipline					
7	Customer satisfaction					
8	Accurate disclosure of financial position					
9	Real time data reconciliation					
10	Land infrastructure development					
11	Faster communication					
12	Faster information access					
13	Others, specify and rate accordingly.....					

17. How would you rate the school performance improvement after adopting SMIS?

0% <10% 10-20% 21-30% 31-40% 41-50% 51-60% 61-70%
71-80% 81-90% 91-100%

INTRODUCTION LETTER



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RE: INTRODUCTION LETTER: ELSIE WANJI OBIMBA

The above named is a registered Masters in Business Administration candidate at the University of Nairobi, Faculty of Business and Management Sciences. She is conducting research on "*School Management Information Systems Adoption and Performance of Secondary Schools in Nairobi County*".

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the Project.

The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your co-operation will be highly appreciated.



PROF. JAMES NJIHIA
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JN/pgr