BUSINESS INFORMATION SYSTEMS CONTRIBUTION AND HOLISTIC EVOLUTION OF PROJECT MANAGEMENT: A CASE STUDY OF KAREN TECHNICAL TRAINING INSTITUTE FOR THE DEAF

NJUGUNA SIMON KANYI

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTERS OF SCIENCE DEGREE IN PROJECT MANAGEMENT AND PLANNING OF MOUNT KENYA UNIVERSITY

NOVEMBER 2024

DECLARATION AND APPROVAL

DECLARATION BY THE RESEARCHER

This thesis is my original work and has never been presented for any academic award in any institution.

Name**:** Njuguna Simon Kanyi

Reg. No**:** MSCPM/2022/50141

Signature:  **Date:** 06/08/2024

Approval

This thesis is being submitted for examination with my approval as University supervisor.

NAME**:** Dr. Njeri. S. Ngacha, PhD, OFS

Institutional Affiliation: Mount Kenya University, Nairobi.

Signature:  Date: 06/08/2024

DEDICATION

I devote my work to my family in appreciation of their inspiration, encouragement and for always believing in me.

ACKNOWLEDGEMENT

I want to express my gratitude to the all-Powerful God for providing me with the knowledge, skills, and strength I needed to complete this endeavor. I express my sincere gratitude to my supervisor, Dr. Njeri. S. Ngacha, for the timeless guidance through my research journey coupled with prompt feedback to my queries, requests and submittals. Further I extend my appreciation to the Mount Kenya University Postgraduate Staff who provided all the requisite information on request. I also want to express my gratitude to my family for offering unsolicited support throughout this study.

In addition, I would want to express my gratitude to my friends for always being a resource for advice and support. I really appreciate your time and your words of encouragement. I would like to express my appreciation to all of the senior managers and employees at the Karen Technical Training Institute for the Deaf who helped me in my search for data related to the project. I greatly appreciate your prompt assistance.

ABSTRACT

The research focused on, business information systems and the impact they have towards the comprehensive betterment of project management globally with specific reference to Karen Technical Training Institute for the Deaf. In particular, the study sought to unravel the influence expert systems, artificial intelligence, knowledge management systems, special purpose systems, electronic commerce, transaction processing systems, mobile commerce, management information systems and decision support systems have towards the evolution of project management wholesomely across all its functional areas. This research was guided by Four dependent variables, one moderating variable and One independent variable; the dependent variables include: Electronic and Mobile Commerce, Enterprise Systems, Information & Decision Support Systems and Specialized Business Information Systems, the moderating variable is; Speed of Information Systems while the independent variable is: Holistic Evolution of project management. The objectives of the study include: to examine the contribution of electronic and mobile commerce towards the betterment of project management, to study the contribution of enterprise systems towards the betterment of project management, to investigate the contribution of information & decision support systems towards the betterment of project management, to find out the contribution of specialized business information systems towards the betterment of project management and to determine the effect of speed in business information systems in reference to efficiency and cost in project management. Computer technology and systems are proving to be an all-time game changer across all aspects of human life allowing human kind to manage day-to-day life issues concisely, human undertakings involve complex management which needs to be adhered to for any human activity to be successful, notably all the human activities fall under the umbrella projects. The ultimate goal of any project regardless of its scope is for it to be completed within the stipulated time, budget and specifications and inclusion of information systems in the management of projects puts them at a vantage point of achieving their objectives with precision. The study employed Experience Survey research design and simple random sampling technique, targeting 55 respondents from the top, middle and lower levels of the KTTID organization management population. The sample size was 48 respondents Questionnaire administration was the principal method of data collection alongside oral interviews. The data used was solely quantitative and therefore inferential and descriptive. The inferential statistics included pearsons correlation analysis. The study found that mobile and electronic commerce contribute to the evolution of project management. Further, enterprise systems contribute to the evolution of project management. The study also showed that information and decision support systems contribute to the evolution of project management. Lastly, specialized business information systems contribute to the evolution of project management. Therefore, the study recommends that organizations leadership are required take ownership of business information systems incorporation by developing policy framework for procurement, planning and management. The authorities should also ensure that even the bits of BIS that scored below the average mean are wholesomely implemented in order to realize the intended corporate objectives and value.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

AI: Artificial Intelligence 13

BIS ..... 1 BIS: Business Information Systems 1

CTT: Cape Town Tourism 2

DSS: Decision Support System 13

EMIS: Education Management Information System 3

ERP: Enterprise Resource Planning 11

IMS: Information Management Systems 3

IS: Information Systems 2

KSF: Key Success Factors 12

KTTID: Karen Technical Training Institute for the Deaf 7

MRP: Manufacturing Resource Planning ..... 17 NACOSTI: National Commission for Science, Technology and Innovation 28

PDA: Personal Digital Assistants 10

POS: Point of Sale System 3

SME: Small and Medium Enterprises 11

TVET: Technical Vocationl Education Training 6

UNCTAD: United Nations Conference on Trade and Development 10

VMMS: Visitor Membership Management System ..... 2 VR: Virtual Reality 14

CHAPTER ONE

INTRODUCTION

1.1 Introduction

“Projects are generally considered successful when they are completed within the stipulated time frame, adhere to the designated budget, and meet the specified scope of work (Holmlin, 2016). The importance of these factors cannot be overstated, as they serve as critical benchmarks for evaluating project performance and overall effectiveness. This research aims to conduct a thorough analysis of the impact that business information systems have on project management. By examining how these systems can enhance ease of operations, improve efficacy in task execution, and ultimately lead to greater stakeholder satisfaction, this study intends to contribute valuable insights into the integration of technology in project management practices. The findings may reveal how leveraging advanced information systems can streamline processes, facilitate communication among team members, and optimize resource allocation, thereby fostering a more productive project environment.”

1.2 Background of the Study.

Business information systems (BIS) are sophisticated frameworks designed specifically for decision support, management information, specialized applications, transaction processing, and the facilitation of mobile and electronic commerce. Essentially, BIS represents a cohesive set of integrated components configured to efficiently input, process, store, and output data and information. This functionality provides organizations with a significant advantage in planning and coordinating both operational and strategic decisionmaking tasks (Mukherjee, 2022). The fundamental elements that comprise a business information system

can be categorized into several key areas: Hardware, Software,Databases,TelecommunicationsandPeople.

The hardware component consists of various computer accessories and devices that perform essential input, processing, and output operations effectively. Software resources, on the other hand, encompass the necessary computer programs that control and manage all the functions of these systems, ensuring seamless operation. Databases serve as organized collections of facts and information, making it easier for businesses to retrieve and analyze data. Telecommunications involve the electronic transmission of signals, enabling efficient communication between different entities within the system. Finally, the human element—often considered the most critical component of BIS—includes endusers, software developers, and hardware designers, all of whom play vital roles in the successful implementation and maintenance of an information system. Together, these elements create a robust framework that supports the dynamic needs of modern businesses.

"Internationally, there is notable capitalization of information systems generally across all sectors of the global economy on account of their guaranteed accuracy, speed, precision, and convenience. In today's fast-paced world, these systems have become indispensable tools that drive efficiency and innovation. Imperatively, the global public has become consciously aware of the essence of the numerous information technologies available in the market and has embraced them as essentials of their day-to-day life across all spheres of human activity, including trade, socialization, health, education, communication, and more. According to Tashtoush (2021), due to the rising sophistication of the duties performed by Jordanian public and private organizations, the significance of information systems has recently expanded and has become a crucial necessity for effective operations. Furthermore, the

complexity of administrative and production procedures has been exacerbated by the rapid development of technology, improvements in production tools and methods, as well as the dynamism of communication and information transmission. Consequently, information systems have effectively facilitated, streamlined, and improved corporate work processes, making them more agile and responsive to market demands. The strategic perspective's importance in contemporary management underscores the necessity for managers to continuously seek innovative ways to boost their organizations' performance effectiveness, efficiency, and output in both productivity and quality. In conclusion, information systems are currently a major area of interest for managers in various corporations, and they are regarded as the most significant and pervasive strategic resource that satisfies pressing demands, enhances corporate productivity, and assists organizations in achieving their long-term objectives while navigating an ever-evolving digital landscape."

In Africa, the pursuit of information technology (IT) and systems is remarkably evident across the entire continent, with economic status and various setbacks notwithstanding. The integration of Information Systems (IS) has been actively pursued by both the public and private sectors, demonstrating a concerted effort toward modernization and efficiency. Massive sensitization campaigns have been conducted to inform the general public about the numerous benefits that come along with the adoption of information systems. As a result, IS continues to be successfully implemented across various sectors such as agriculture, tourism, mining, and transportation, among others. These advancements in information systems have brought about a significant paradigm shift in how firms operate and have fundamentally altered the management dynamics of modern enterprises. The management and communication within and between organizations have been greatly facilitated by a variety

of innovative technological solutions. For instance, Bere et al. (2014) highlight that the tourism sector in South Africa has reaped substantial benefits from the integration of information systems. A prime example is the development of destination management systems, which allow businesses to coordinate their operations and effectively market their products and services. Before 2009, the majority of activities in Cape Town's tourism industry were conducted manually. Inventory management relied heavily on Excel spreadsheets, accounting was managed using unidentified software, and membership data was also maintained through spreadsheets. However, these manual operating techniques could not meet the modern demands of a rapidly expanding corporation.

Recognizing these challenges, the Cape Town Tourism (CTT) organization's executive leadership team, in collaboration with the board, devised a strategic plan aimed at implementing robust mechanisms to manage finances, retail, client relations, and membership initiatives. This initiative was essential for ensuring that CTT remained viable and competitive in a dynamic marketplace. To broaden the scope of their products and services, streamline operational processes, eliminate duplication, and enhance internal efficiency, CTT adopted various information systems technologies, including the Visitor Membership Management System (VMMS), Point of Sale System (POS), and Syspro. In conclusion, there is strong evidence to suggest that information technologies are widely acknowledged as critical drivers of enterprise-wide agility and business continuity. From the perspective of system performance, particularly in the realm of e-business, these technologies can be leveraged to reduce downtime, thereby increasing uptime, which ultimately contributes to improved financial outcomes and overall operational efficiency. Furthermore, it is evident that organizations that fail to embrace current technologies risk

becoming inefficient and losing their competitive edge in an increasingly digital world. The ongoing digital transformation across Africa highlights the crucial role that information systems play in fostering sustainable economic growth and enhancing the continent's competitiveness on a global scale.

In Kenya, the Social Pillar of Education and Training sector under the framework of Vision 2030 explicitly mandates the development of Education Management Information Systems (EMIS) as outlined in clause no 5. This initiative aims to enhance and harmonize EMIS with Education Financial Management Information Systems (EFMIS), thereby creating a more efficient educational infrastructure that can support the nation's development goals. Management Information Systems (MIS) are vital tools utilized by various organizations to effectively manage information and provide essential operational assistance. As noted by Kenyatta University (2021), these systems play a crucial role in assisting managers in making informed decisions by delivering accurate and timely information regarding the daily operations of the organization. The advent of the Fourth Industrial Revolution has ushered in a new era characterized by discussions around the knowledge economy and the information age. As a result, the significance of MIS has escalated, making it an indispensable component for businesses and organizations striving to thrive in a rapidly evolving landscape. While there are notable similarities between MIS and Information Technology (IT), it is essential to recognize their distinct roles. IT predominantly focuses on the computing systems that facilitate the transfer and management of information, whereas MIS emphasizes the establishment of comprehensive systems within an organization that leverage these technologies effectively. Despite numerous software applications marketing themselves as management information systems, it is important to understand that many are

essentially tools rather than fullyfledged systems. While the software is undeniably significant, the true essence of an information system encompasses various elements, including organizational charts and reporting structures that are intrinsic to the functioning of a business. Consequently, while MIS is closely related to software from a technological perspective, its true relevance lies in the organizational systems it supports, which may utilize MIS software to enhance operational efficiency. Furthermore, there is often confusion between Information

Management Systems (IMS) and MIS, although a vital distinction exists between the two. An IMS refers to any system with a database capable of storing and retrieving information, functioning primarily to manage data. In contrast, MIS software is specifically designed to assist management in making decisions that are critical to the operational success of the organization. There are diverse types of management information systems tailored to the unique needs of various businesses. Regardless of size, organizations typically implement systems to manage their diverse tasks and functions. Some systems, such as those for human resources, marketing, and accounting, are nearly universal across industries, while others may cater to specific sectors. For numerous enterprises, monitoring aspects like inventory management, transaction processing, and sales analytics is paramount. By utilizing management information systems, management teams can extract relevant data from these organizational functions, which subsequently informs their strategic decisionmaking processes. The overarching goal of implementing these systems is to consolidate pertinent information from each functional area of the business. As a result, managers gain immediate access to vital corporate data, equipping them with the necessary tools to make strategic and informed decisions that drive organizational success and foster sustainable growth. This

integration of data not only streamlines operations but also enhances the overall efficacy of managerial practices, paving the way for a more informed approach to governance and resource allocation within organizations.

As stated in a 2019 policy brief, the Ministry of Health in Kenya is actively seeking to enhance and improve its health management information systems, which are crucial for effective healthcare delivery and decision-making. The agency reported that its Electronic District Health Information System (DHIS) had been introduced and successfully implemented on a national scale. This system is designed to streamline the collection, analysis, and dissemination of health data across various levels of the health sector, ensuring that accurate and timely information is available to health professionals and policymakers alike. The implementation of the Electronic DHIS marks a significant step forward in Kenya's efforts to modernize its healthcare infrastructure. By digitizing health information, the Ministry aims to reduce instances of data duplication, improve reporting accuracy, and facilitate real-time access to health statistics. Additionally, this system allows for better tracking of health indicators, thereby enabling the government to respond more effectively to public health challenges and allocate resources where they are most needed. Moreover, the Kenya Health Act of 2017 lays the groundwork for a comprehensive national health information system that is responsive to the evolving demographic demands of the population. This legislative framework is pivotal in establishing standards and guidelines for health data management, ensuring that the information collected is relevant, reliable, and useful for planning and evaluation purposes. The act emphasizes the importance of integrating health information across various sectors and levels of government, which is essential for a coordinated response to health issues. In conjunction with the Health

Information Policy for 2014–2030, these initiatives reflect Kenya's commitment to strengthening its health systems through evidence-based decisionmaking. The policy outlines strategic priorities for the development and utilization of health information, aiming to foster a culture of data-driven practices within the healthcare system. By emphasizing the importance of health information, the government is not only improving service delivery but is also enhancing accountability and transparency within the health sector. As a result, patients can expect more efficient and effective healthcare services that are informed by accurate and comprehensive data.

The Kenyan government is actively working to enhance its national information systems specifically tailored for the tourism industry. The COVID-19 pandemic has had a significant impact on international travel, leading to a dramatic decrease in tourist arrivals. In response to this unprecedented challenge, Kenya's tourism ministry recognized the urgent need for innovation and adaptation to the changing landscape of global travel. This situation has prompted the ministry to rethink its strategies and implement new solutions to revitalize the sector. In July 2020, the ministry announced a comprehensive strategy aimed at digitizing various aspects of the tourism industry, reflecting a forward-thinking approach to recovery. One of the key components of this strategy is the development of an Integrated Destination Management System (IDMS). This system is designed to collect and analyze data in a more dynamic and efficient manner, moving beyond traditional methods that rely on paper and static tables. By harnessing technology, the IDMS aims to identify and visualize market trends, patterns, opportunities, and threats that may have previously gone unnoticed. The establishment of the IDMS is not merely a response to the current crisis but is also a proactive measure aimed at ensuring sustainable planning, marketing, and management of tourism in

Kenya. The ministry believes that having real-time data will empower stakeholders in the tourism sector, enabling them to make informed decisions that can enhance the visitor experience and optimize resource allocation. This shift toward a data-driven approach is crucial for adapting to the evolving needs and preferences of travelers in a post-COVID world. Moreover, the integration of advanced technology in tourism management can lead to improved marketing strategies, better customer engagement, and enhanced operational efficiency. By utilizing digital tools and platforms, the Kenyan tourism industry can better showcase its diverse offerings, from breathtaking landscapes to rich cultural experiences, thus attracting both domestic and international visitors. The government's commitment to embracing technology represents a significant step toward rejuvenating the tourism sector, ensuring that it not only recovers but thrives in the future.

1.3 Statement of the Problem

Business Information Systems (BIS) serve as essential frameworks that integrate various critical components that managers require to effectively run and optimize an organization. These systems encompass a wide range of technologies and methodologies designed specifically for different business functions. Among the most significant categories of BIS are those tailored for electronic and mobile commerce, enterprise resource planning (ERP) systems, information and decision support systems, as well as specialized business information systems that cater to unique industry needs. By leveraging these systems, managers are equipped with the tools and information necessary to make informed decisions, which can significantly enhance operational efficiency and strategic planning. The integration of electronic and mobile commerce systems, for instance, allows businesses to reach customers in innovative ways, streamline transactions, and improve customer

engagement. These systems are crucial in today's digital landscape, where consumer preferences are rapidly evolving, and the ability to adapt to these changes can determine a company's success. Enterprise systems, on the other hand, provide a comprehensive platform for managing core business processes, including supply chain management, human resources, and financial operations. By centralizing data and automating workflows, enterprise systems facilitate better collaboration across departments and help organizations maintain consistency in their operations. Furthermore, information and decision support systems play a pivotal role in analyzing data and generating insights that inform strategic choices. These systems enable managers to sift through vast amounts of information, identify trends, and evaluate the potential impact of different decisions. The use of advanced analytics and business intelligence tools within these systems empowers organizations to harness data-driven insights, leading to more effective decision-making. It is important to note that the specific needs for business information systems will vary significantly across organizations, influenced by factors such as industry, size, and operational complexities. However, a fundamental requirement that remains constant across all businesses is the trustworthiness of the data processed and utilized within these systems. Accurate, reliable data is the bedrock upon which sound business decisions are made, and organizations must prioritize data integrity to ensure that their business information systems deliver the desired outcomes. Thus, investing in robust BIS not only enhances operational capabilities but also fortifies the foundation of strategic decision-making.

Business Information Systems (BIS) play a pivotal role in modern organizations by systematically gathering and integrating data from various departments. The primary objective of these systems is to ensure that management has comprehensive access to

relevant information regarding the firm's operational performance. This holistic view is essential for informed decision-making, as it allows executives to analyze trends, identify potential issues, and capitalize on opportunities. By providing a structured framework for data collection and analysis, BIS transforms raw data into actionable insights, thereby enhancing the overall efficiency of the organization. Furthermore, Business Information Systems are invaluable tools that support management in strategic planning and operational execution. They enable managers to track key performance indicators (KPIs) and assess the effectiveness of different business strategies. With the ability to generate real-time reports and forecasts, BIS empower leaders to make timely decisions that align with the company's objectives. Kenyatta University (2021) highlights that Management Information Systems (MIS) represent a rapidly growing field of employment, reflecting the increasing reliance on data-driven decision-making across industries. In the context of the

Fourth Industrial Revolution, often referred to as the Information Age, the significance of BIS becomes even more pronounced. As organizations navigate the complexities of digital transformation, the ability to effectively manage vast amounts of data is crucial. The advancements in technology have made it feasible to collect, store, and analyze data on an unprecedented scale. Consequently, professionals who possess the skills to organize, process, and interpret this data are poised to thrive in the evolving job market. As we look ahead, it is clear that the demand for skilled individuals in the field of Business Information Systems will continue to grow. Organizations will seek out talent that can leverage data analytics and business intelligence to drive innovation and maintain a competitive edge. The interplay between technology and data is set to redefine the landscape of business operations, making expertise in BIS an essential asset for future professionals. In summary, the role of

Business Information Systems is integral to the success of contemporary organizations, providing the tools necessary for informed decision-making and strategic growth.

Numerous research efforts on information systems and technology have been undertaken, reflecting the growing significance of these fields in contemporary business practices. As a relatively new domain, business information systems encompass a wide range of topics and applications that are crucial for organizations seeking to leverage technology for competitive advantage. However, despite the increasing interest and investment in this area, there has yet to be a comprehensive study that systematically analyzes all four of its subfields: electronic and mobile commerce, enterprise systems, information and decision support systems, and specialized business information systems. This lack of a holistic approach represents a significant research gap. The importance of understanding these subfields cannot be overstated, as they play a pivotal role in the development and execution of effective project management across all ten knowledge areas as outlined by the Project Management Institute (PMI). Each of these subfields offers unique contributions that can enhance project management practices. For instance, electronic and mobile commerce facilitate improved stakeholder communication and transaction efficiency, while enterprise systems provide integrated solutions for resource planning and management. Information and decision support systems empower project managers with data-driven insights, enabling them to make informed decisions quickly and effectively. Specialized business information systems cater to industry-specific needs, offering tailored solutions that can optimize project outcomes. Moreover, the interplay between these subfields and their collective impact on project management is an area that warrants further investigation. Exploring how these systems can be integrated and utilized in concert could lead to innovative methodologies and frameworks

that enhance project delivery and execution. Additionally, examining the evolving nature of technology and its influence on project management practices can yield valuable insights into future trends and challenges that organizations may face. Hence, filling this research gap is essential not only for academic enrichment but also for providing practical solutions that can drive efficiency and effectiveness in project management across various industries. Ultimately, a comprehensive study in this area would contribute to a deeper understanding of the synergy between business information systems and project management, paving the way for more informed strategies in an increasingly digital world.

1.4 Purpose of the Study

In reference to the preceding paragraphs, the aim of this study was to bridge the gap by examining business information systems and their contribution towards the holistic evolution of project management. To achieve this, a detailed case study was conducted at the Karen Technical Training Institute for the Deaf. This institution serves as a unique and insightful context for exploring how business information systems can enhance project management practices, especially in environments that may face specific challenges related to communication and accessibility. The significance of this study lies in its potential to illuminate the ways in which technology can be harnessed to empower organizations, particularly those that cater to marginalized communities. Business information systems, which encompass tools and technologies designed to collect, store, manage, and analyze data, can play a pivotal role in streamlining project management processes. By employing these systems, organizations can improve efficiency, foster collaboration, and enhance decision-making. At the Karen Technical Training Institute for the Deaf, the implementation

of effective business information systems is crucial for addressing the unique needs of its students and staff. These systems can facilitate better communication, allowing for more effective project planning and execution. By integrating information technology into their project management frameworks, the institute can ensure that all stakeholders, including deaf students and instructors, can participate fully and meaningfully in the development and delivery of educational programs. Moreover, the case study aims to uncover best practices and strategies that can be employed by similar institutions to optimize their project management efforts. Through rigorous analysis and evaluation, the research will provide valuable insights into the specific contributions that business information systems make toward improving project outcomes. This study not only seeks to contribute to the academic literature on project management and information systems but also aims to provide actionable recommendations for practitioners in the field. In summary, the exploration of business information systems at the Karen Technical Training Institute for the Deaf will reveal their essential role in enhancing project management, thereby fostering a more inclusive and effective educational environment.

1.5 Objectives of the Study

1.5.1 General Objective

The primary aim of this study was to conduct a comprehensive examination of business information systems and their significant contribution toward the holistic evolution of project management. In an increasingly dynamic and complex business environment, organizations are continually seeking ways to enhance their operational efficiency and effectiveness. Business information systems play a pivotal role in this endeavor by providing

the necessary tools and frameworks that facilitate the management of projects from inception to completion. As project management evolves, it is essential to understand how various information systems can be integrated into project workflows. These systems encompass a wide range of technologies, including project management software, collaboration tools, and data analytics platforms. Each of these components contributes uniquely to the overall project management process, enabling teams to plan, execute, and monitor projects with greater precision and agility.

Furthermore, this study aimed to explore the relationship between business information systems and key project management methodologies, such as Agile, Waterfall, and Lean. By examining how these methodologies can be enhanced through the effective use of information systems, we can identify best practices that promote project success. For instance, Agile project management emphasizes iterative progress and flexibility, and the integration of real-time data analytics can significantly improve decision-making and responsiveness to changing project requirements. Additionally, the research sought to analyze the impact of information systems on stakeholder engagement and communication within project teams. Effective communication is a cornerstone of successful project management, and information systems facilitate transparent information sharing, fostering collaboration among team members and stakeholders. This aspect of project management is particularly critical in today's globalized work environment, where teams often consist of members from diverse geographical locations and cultural backgrounds. In summary, this study aimed to provide a nuanced understanding of how business information systems contribute to the holistic evolution of project management. By investigating their roles,

benefits, and integration with various methodologies, the research highlights the importance of leveraging technology to enhance project outcomes and drive organizational success.

1.5.2 specific Objectives

The specific objectives of this study encompassed a comprehensive examination of several key areas within project management, particularly focusing on the profound effects that modern technological advancements have on its various knowledge domains. The primary objectives are outlined as follows:

i. To assess the improvement of project management across all of its knowledge domains as a result of electronic and mobile commerce. This objective aims to analyze how the integration of electronic and mobile commerce has transformed traditional project management practices. By leveraging digital platforms, project managers can enhance collaboration, streamline communication, and facilitate realtime updates, which are crucial for effective project execution. The study will investigate specific tools and methodologies that have emerged from this technological shift and how they contribute to overall project success.

ii. ii. To research the improvement of project management across all of its knowledge domains that enterprise systems have brought about. This objective focuses on the impact of enterprise resource planning (ERP) systems and other enterprise solutions that integrate various business processes. By examining how these systems enhance data accuracy and accessibility, the study aims to uncover the ways in which they support project managers in making informed decisions and optimizing

resource allocation.

iii. iii. To investigate how the fusion of information and decision support technologies has improved project management across all of its knowledge domains. This objective emphasizes the role of advanced analytics, artificial intelligence, and machine learning in project management. The study seeks to explore how these technologies provide project managers with insights that were previously unattainable, enabling them to anticipate challenges and make proactive adjustments to project plans.

iv. To study the improvement of project management throughout all of its knowledge domains and the contribution of special business information systems thereto. This objective will delve into the specific business information systems designed to address unique project management needs. The study will analyze their functionalities and how they integrate with existing processes to enhance overall project performance.

v. To ascertain how project management efficiency and costs are impacted by the speed of business information systems. This objective will examine the correlation between the rapid deployment of business information systems and their influence on project timelines and budget management. By assessing these dynamics, the study aims to provide valuable insights into optimizing project outcomes in an increasingly fast-paced business environment.

Through these objectives, the study seeks to contribute significantly to the understanding of how technology reshapes project management practices, thereby equipping practitioners with the knowledge to leverage these advancements effectively.

1.6 Research Questions

The following research questions are designed to explore the multifaceted aspects of project management and the significant role that technology plays in enhancing its effectiveness across various knowledge domains. These inquiries aim to provide a comprehensive understanding of how modern tools and systems influence project management practices.

i. How does the use of electronic and mobile commerce improve project management across all of its knowledge domains?

In the current digital age, electronic and mobile commerce have transformed the way businesses operate. This question seeks to investigate how these platforms facilitate communication, streamline processes, and enhance collaboration among project teams. Moreover, it will delve into how the accessibility of project-related information through mobile devices can lead to more timely decision-making and improved stakeholder engagement. By understanding the interplay between commerce and project management, we can uncover the potential for increased efficiency and effectiveness across various project phases.

ii. What part do enterprise systems play in improving project management across all of its knowledge domains?

Enterprise systems serve as integrated platforms that support various business functions, including finance, human resources, and operations. This question aims to explore the extent to which these systems enhance project management by providing real-time data, facilitating resource allocation, and promoting cross-functional collaboration. The analysis will focus on how enterprise systems can bridge gaps between different knowledge domains, thereby fostering a more cohesive approach to project execution and oversight.

iii. How do information and decision support systems contribute to the improvement of project management in all of its knowledge areas?

Information systems and decision support tools are crucial for effective project management, providing valuable insights through data analysis and reporting features. This question will examine the role these systems play in enhancing decision-making processes, risk management, and performance evaluation. By analyzing their contributions, we can assess how they support project managers in navigating complexities and making informed choices that drive project success.

iv. How can project management be improved across all of its knowledge domains with the use of specialist business information systems? Specialist business information systems are designed to cater to specific industry needs and challenges. This question will focus on the ways these systems can enhance project management practices by offering tailored solutions that address unique project requirements. The research will explore the potential benefits of

integrating specialized tools into the project management workflow, including improved tracking, reporting, and stakeholder communication.

v. What relationship exists between the speed of information systems and project management efficiency and cost?

The speed at which information is processed and disseminated plays a critical role in the overall efficiency of project management. This question seeks to uncover the correlation between the responsiveness of information systems and the effectiveness of project execution, including cost implications. By examining this relationship, we can identify strategies to leverage rapid information processing to optimize project timelines and budget management, ultimately leading to better project outcomes.

1.7 Significance of the Study

The following stakeholders will gain significantly from the findings of this study: 1.7.1 The Administration of Karen Technical Training Institute for the Deaf: Once the significance and benefits of Business Information Systems (BIS) are clearly articulated and understood by the management of KTTID, they will find themselves in a much more advantageous position to make informed and strategic decisions. These decisions will pertain to the critical need for increased investments in BIS, which will ultimately lead to higher effectiveness and efficiency in managing the various operational sections of the institution. By understanding the specific requirements for optimal system performance, the management will be equipped to perform a cost-efficiency analysis of various business information systems available in

the market. This knowledge will serve as a comprehensive guide during the essential phases of acquiring and implementing these systems, ensuring that the institute's resources are utilized effectively and that the selected systems align with its operational goals. 1.7.2 Other Technical and Vocational Education and Training (TVET) Institutions: The findings of this study will serve as an invaluable resource for other TVET institutions. They will provide a framework illustrating the critical importance of incorporating information systems into their administrative and operational processes. Additionally, the study will act as a reference journal that catalogs various BIS options available in the market, detailing their specific purposes and functionalities. By leveraging this information, other institutions can enhance their capacity to improve access, quality, and relevance in TVET programs. This will, in turn, empower vulnerable youth by equipping them with relevant skills and contemporary work experiences that meet the evolving demands of the job market. 1.7.3 Other Researchers:

The results of this study will be a significant asset to other researchers engaged in similar or related fields of study. When conducting future research on pertinent topics, the insights and data presented in this study can be cited as a reliable source of secondary data. This will not only bolster their research findings but also contribute to a broader understanding of the relevance and impact of Business Information Systems in educational settings. By providing a comprehensive analysis of the role of BIS in enhancing operational efficiency, this study will pave the way for further academic inquiry and exploration into the integration of technology in vocational education.

1.8 Scope of the Study

This study is designed to delve into the significant role that business information systems have played in the overall development and enhancement of project management practices. The investigation will be conducted at the Karen Technical Training for the Deaf, which is strategically located in Nairobi County, specifically in the vibrant area of Karen Town. This institution is known for its commitment to providing education and vocational training to individuals with hearing impairments, thereby empowering them with skills that can enhance their employability and quality of life. The focus of this study is on individuals across all three levels of management within the institution, regardless of their age or tenure. This inclusive approach ensures that a diverse range of perspectives is captured, providing a comprehensive understanding of how business information systems influence project management from various managerial viewpoints. By engaging with toplevel executives, middle management, and lower-level staff, the study aims to uncover the multifaceted impact of these systems on the institution's operational efficiency and project execution. To achieve these objectives, the study will employ an experience survey research design coupled with a simple random sampling technique. This method will target respondents from the top, middle, and lower management strata of the organization, ensuring that the insights gathered reflect the experiences and opinions of all levels of the workforce. The principal method of data collection will involve administering questionnaires, which will be supplemented by oral interviews to gain deeper qualitative insights into the respondents' experiences and views. The anticipated outcomes of the research will be meticulously analyzed using both qualitative and quantitative methods. The findings will be presented in a clear and accessible format, utilizing diagrams, tables, and charts to visually represent the data and facilitate

understanding. The entire investigation is scheduled to take place over a three-month period, from July to September 2024. This timeline will allow for thorough data collection, analysis, and interpretation, ultimately leading to the formulation of informed conclusions about the role of business information systems in enhancing project management practices within the institution.

1.9 Limitations of the Study

The limitations of this study included several key factors that may impact the overall findings and their applicability in a broader context.

1.9.1 Funding Constraints: One of the primary limitations faced during this research was the scarcity of financial resources. Adequate funding is essential for facilitating extensive research that encompasses a wide range of organizations, both nationally and internationally. Without sufficient financial backing, the scope of the study is inevitably limited, restricting the ability to gather diverse data from various sources. This constraint necessitated a more focused approach, leading to the decision to conduct an intensive study specifically at KTTID. Although this allows for a thorough investigation within the confines of one organization, it also means that the data collected may not fully represent the broader industry or context. The lack of wider financial resources ultimately hampers the potential for a comprehensive understanding of the subject matter, which

could have been achieved through a more expansive research effort.

1.9.2 Limited Geographical Coverage: Another significant limitation of this research is its restricted geographical coverage. The study will be conducted within a single organization, KTTID, which inherently limits access to a narrow geographic area. This confinement results in a limited range of possible responses and perspectives, potentially skewing the findings. With only a localized sample, there is a risk of obtaining results that do not accurately reflect the broader population or the diversity of experiences found in different organizational settings. Furthermore, this limitation forces the

reliance on quantitative studies, which can be influenced by nonrepresentative samples. Qualitative research, while valuable for providing in-depth insights, may also face challenges in achieving data saturation due to the narrow focus. Thus, the exhaustive research confined to KTTID may yield substantive responses, but it will also raise questions regarding the generalizability of these findings to other organizations or sectors. In summary, while the study aims to gather meaningful data, the financial and geographical limitations must be acknowledged as factors that could impact the overall applicability of the research outcomes.

1.10 Delimitations of the Study

Time Constraints: The study period of this research had been capped at three months to ensure it is achievable within the time boundaries assigned by Mt. Kenya University. This limitation was put in place to maintain a focused and manageable research scope, allowing for a thorough investigation of the topic while adhering to the university's timelines. Conducting research within a defined timeframe is crucial not only for the researcher but also for the institution, which must allocate resources effectively and ensure that academic programs are completed on schedule. A three-month period may seem relatively short for comprehensive research, particularly in fields that demand extensive data collection, analysis, and interpretation. However, this timeframe was strategically chosen to facilitate a concentrated effort, enabling the researcher to delve deeply into the subject matter without becoming overwhelmed by the breadth of potential variables and factors that could be explored. The constraints also help to cultivate a sense of urgency and focus, compelling the researcher to prioritize essential tasks and streamline the research process. Moreover, setting a specific time limit encourages disciplined time management and planning. The researcher must develop a clear timeline for each stage of the research process, including literature review, data collection, analysis, and presentation of findings. This structured approach not only enhances efficiency but also fosters a greater sense of accountability. By adhering to a predetermined schedule, the researcher can monitor progress more effectively and make necessary adjustments to ensure that all objectives are met within the allocated

timeframe. In addition to these practical benefits, the time constraints also provide an opportunity for the researcher to develop important skills that are valuable in academic and professional settings. These skills include prioritization, critical thinking, and adaptability, all of which are crucial for successfully navigating research challenges. Ultimately, while the three-month study period presents certain limitations, it simultaneously offers a framework that can lead to productive and meaningful research outcomes. This balance between constraints and opportunities is a fundamental aspect of the research process, reflecting the dynamic nature of academic inquiry.

1.11 Assumptions of the Study

The initial assumptions outlined in this study are foundational to ensuring the integrity and validity of the research findings. The first assumption revolves around the expectation that participants will engage in the study with honesty and impartiality when discussing the subject matter. To bolster this expectation, survey respondents will be provided with explicit written assurances regarding the confidentiality and anonymity of their contributions. This measure is designed to significantly reduce any potential hesitance or dishonesty that may arise in their responses, thereby fostering a more open and truthful dialogue. It is imperative that participants feel secure in sharing their thoughts and experiences without fear of judgment or repercussions.

The second assumption posits that participants will be evenly distributed across the three levels of management—top-level, middle-level, and lower-level management. This balanced representation is crucial for obtaining a comprehensive understanding of the dynamics at play within the organization and the varying perspectives that come from different management tiers. Such diversity in responses can lead to richer insights and a more nuanced analysis of the subject matter. The third assumption emphasizes the importance of comprehension among survey respondents regarding the survey questions and the concepts they embody. It is essential that participants not only understand the questions posed but also grasp the underlying themes and ideas that the research aims to explore.

This understanding is vital for ensuring that the data collected accurately reflects the participants' views and experiences.

The fourth assumption concerns the interpretation of the data, which presupposes that participants possess a solid grasp of the semantics associated with the discipline and relevant experiences that pertain to the research focus. As highlighted by Neubert and McNeal (2017), it is critical to acknowledge the role of language in the research process. Comprehending the meaning of words and phrases is fundamental to effective communication and data analysis. It is, therefore, presumed that proficiency in the specific language relevant to the research issue is not only advantageous but necessary for accurate data processing and interpretation. This proficiency ensures that the nuances of respondents' insights are captured and understood within the context of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the literature that is currently available and relevant to the study's goals. In order to fill the study gap on the subject of how Business Information Systems contribute to the overall evolution of project management, significant theoretical and practical concerns are also included. In summary this chapter encompasses the introduction,

empirical review, theoretical review, conceptual framework and a recap of the literature review.

2.2 Review of Empirical Literature

This section sort to unravel various successful attempts by different scholars in a bid to explain the benefits of Business Information Systems and why they should be capitalized and integrated in various sectors of the economy.

2.2.1 Electronic Commerce and Mobile Commerce

Mobile is rapidly becoming the main tool of communication, owing to the fact that it is not only more cost-effective to construct a mobile network, but it also gives better liberty and convenience to users than a landline phone. According to Ali & Sami, (2016), mobile commerce is a subset of e-commerce that includes all e-commerce transactions that happen on a mobile (handheld) device. The use of wireless internet for financial transactions, services, and purchases is the only distinction between M-commerce and E-commerce. Different forms of M-commerce, including business-to-business, business-to-consumer, and consumer-to-consumer, have emerged recently, and their rising popularity has compelled companies to create new commerce platforms that can appeal to a wide customer base. M-commerce has drawn considerable attention due to its distinctive features, and the cell phone has been essential to communication technology due to its adaptability and excellence. Due to its adaptability and simplicity of use, it has surpassed the fixed phone in popularity globally. The software platform is essential for the operation of any mobile device, and the ability of the mobile phone to function as a minicomputer has revolutionized communication (Kumar, 2019). Foster (2020), mobile commerce, despite its enormous popularity, is still in its infancy and has the potential to permeate all facets of human activity.

Mobile commerce is the most discussed issue today. Business organizations have been assessing the m-commerce sector's income potential and designing business strategies so as to capitalize on the exemplary profit possibilities of this new market. The increased flexibility and power of wireless agreements opens up new options for improving customer service. In reality, this implies that genuine services are available at all times (regardless of the person's location). According to Stephen (2021), mobile commerce has penetrated the banking, services, retail, telecommunications and information technology services in today's business enterprises. M-commerce is becoming increasingly popular over time in various areas, not only because it is generally acknowledged, but also because it is becoming a more popular means of doing business and trade.

M-commerce (Zhang et al., 2014) is also referred to as mobile e-commerce since it uses a mobile terminal and a wireless network to carry out transactions. M-commerce, according to UNCTAD (2022), is the exchange of goods and services via wireless handheld devices such smartphones or personal digital assistants (PDAs). The internet is a significant part of our daily lives and has changed through time from being a static repository of knowledge to a platform for services. Airline and building reservations are two of these services. The most recent trend, known as m-commerce, is propelling e-commerce forward over the long term. The value chain refers to a collection of company operations that carry out interactions between online customers and e-commerce platforms. The eight techniques Song and Whang suggested are attract, interact, customize, transact, pay, deliver, serve, and personalize (Song et al., 2000). The integration of these value chains into M-commerce needs some fine-tuning due to wireless communication channels and mobile devices. Mobile commerce is still in its infancy whereas e-commerce development is moving quickly. On the other hand, as the

wireless network grows, it is anticipated that emerging wireless and mobile networks will open up new opportunities for development in mobile commerce, provide new business models for mobile operators, and provide new applications to businesses and consumers (Coursaris and Hassanein, 2013). Mobile commerce is the logical continuation of electronic commerce (Mahil, 2018). Ting (2014), due to the rapid growth of mobile devices like smartphones, PDAs1, and portable computers, mobile commerce is frequently seen as a key driver for next-generation ecommerce.

The Gartner Group predicts that consumer to business e-commerce will soon be possible using smart phones and mobile commerce technologies. According to numerous researchers, wireless and M-commerce will represent the next stage of development for electronic businesses (Ngai & Gunasekaran, 2017). Understanding the potential effects on enterprises will be made easier with a quick review of the terminology and background information on mobile commerce. Another name for mobile electronic commerce, often known as wireless electronic commerce, is M-Commerce. Stafford et al., (2013), mobile commerce is anticipated to be the next gold rush after e-commerce, and numerous business groupings are vying for a piece of the action.

2.2.2 Enterprise Systems

To gain a comprehensive picture of ERP system evolution, Costa et al. [5] conducted an analysis of the previously published literature on ERP systems from 1990 to 2015. They discovered that, although there have been more studies on ERP systems over the past 25 years, the majority of these studies had a strong emphasis on the implementation phase. According to Eid and Abbas [15], researchers haven't shown much interest in studying how

users adapt to ERP systems and how it affects ERP result aspects. Other factors may also influence how ERP systems effect firms, but few studies have looked at these other factors. Studies on SMEs are uncommon in Saudi Arabia, and the majority of the research focuses on how large firms perform while using ERP systems. The majority of earlier studies on SMEs in Saudi Arabia investigated how an enterprise is categorised as a small firm or a medium-sized enterprise, according to Zafar et al. [9]. It is crucial to concentrate on how ERP systems affect SMEs as a result. Additionally, the majority of earlier studies have centered on identifying the key success factors (KSFs) connected to the deployment of ERP systems, with a particular focus on the installation stage of ERP systems. Almuhayfith et al., (2020), the use of ERP systems is one of the topics in the literature that hasn't been well researched.

There has been a noticeable increase in the integration of enterprise resource planning with business operations in first-world nations like the United Kingdom and the United States of America (Axline, 2014). Enterprise resource planning (ERP) systems created by companies like Oracle, Baan, People Soft, and SAP are increasingly being used by businesses as business information platform (BIP) systems, which has boosted their level of productivity, efficiency, and cost savings. The application of ERPs may be hampered in developing African nations by their low economic potential, scarce human resources, poor infrastructure, and unique values (Al-Debei and Al-Lozi, 2012). According to a 2016 study by Tobie, Etoundi, and Zoa on the adoption of ERP in African nations, SAP, Oracle, and Microsoft have dominated the market for the software. In Egypt and Libya, manufacturing and oil firms are mostly using ERP software, whereas in Nigeria, Zimbabwe, and Ethiopia, large and private businesses use it. In South Africa, both the main public universities and the

large private sectors have embraced the usage of ERP. The research revealed that in Kenya, the ERP system is mostly in the government offices.

The manufacturing and retail sectors are the only ones where enterprise resource systems have reached maturity. Kenya's state universities are fast embracing the market penetration of software. The ERP system is seen as a long-term plan by the customers that adopt it (Bala and Venkatesh, 2013). Institutions can monitor and manage all of their resources and services with the help of ERP systems. To meet the specific requirements of the organization, ERP systems are tailored by the software vendors or developers. The adoption and successful integration of the finance, student management, human resource, and procurement modules can be attributed to the proportion of ERP implementation at

Kenyan universities (Makokha, Musieg, and Juma, 2013). However other modules like those for catering, hostels, and health—are gradually being incorporated into the most recent services offered by the vendors to the Institutions.

2.2.3 Information and Decision Support Systems

According to Drucker (2017), access to and the processing of information will be crucial as the world transitions into the post-industrial era. As a result, it is doubtful that organizations whose structures, procedures, and technologies are not well suited to deal with the growing complexity of the environment and of knowledge will survive. Organizations must continuously absorb new skills, information, and routines about products, processes, and social relations in order to survive and grow in these intensely competitive marketplaces and complicated environments.

According to Rong et al. (2023), as business intelligence technology advances, so does the depth of the application research for decision support systems (DSSs). Since the study in this

area only recently began in China, there aren't many DSS research instances to help promote DSS. According to research, with continuous development, the system can not only assist users in conducting rational and scientific analyses of marketing decisionmaking, making the marketing decision-making process more scientific and reasonable, but it can also introduce fresh perspectives to enterprise decision-makers, fostering system progress and improvement.

The marketing decision support system still has issues with data integration, historical data, query function, and data analysis as of right now, according to Zaki et al. (2023). Due to the fact that DSS offers strong support for businesses to improve their decision-making ability, including structured, semi-structured, and unstructured qualitative decisions which can greatly improve the effectiveness of decision-making by senior managers, there are few research cases of DSS for auxiliary marketing decision-making.

2.2.4 Specialized Business Information Systems

Manufacturing, digital marketing, and healthcare are just a few of the industries where studies have already demonstrated the potential benefits of implementing AI (Juniper Research, 2018). As product automation rises and industry adopts more AI and cyber physical systems, factories for manufacturing are projected to use AI widely (Wang & Wang, 2016). Researchers in the field of healthcare suggest employing AI systems connected to sensors worn by people to track and record their health (Rubik & Jabs, 2018). According to Juniper Research (2018), demand forecasting using AI will more than triple between 2019 and 2023, and chat bot interactions will increase from their present level of 2.6 billion to 22 billion in the same year. However, one may only take advantage of these chances if they are aware of what AI is.

An expert system is a collection of software that analyzes a problem in a manner similar to how a human expert would. For instance, a number of traditional expert systems were created to identify medical issues based on the expertise and diagnostic methods of doctors (Hufnagel, S., & Gierer, A. 2017). The oldest and most reliable artificial intelligence (AI) technology is called an expert system. Expert systems have been shown to boost productivity, improve product quality and timeliness, and save money much beyond their development costs in a number of well-known success stories (Cheng, Wang and Luo, 2018). These technologies have generally been used to solve the following types of issues: diagnosis, categorization, scheduling, configuration, monitoring, and design (Kelly, 2013). Although multiple expert systems have been built for other statistical applications (Hand & Kelly, 2015), the technology hasn't been used much in survey research given that data collecting is essential for any business that wants to advance.

Businesses can achieve extraordinary organizational performance, gain distinct competitive advantages, and succeed in one or more value-added disciplines, according to researchers (Torabi and El-Den, 2017). Since knowledge management actively uses knowledge and skills to improve organizational effectiveness and contribute value, it is probably a strategy with added value (Raula et al., 2014). According to Shujahat et al. (2019), businesses with greater knowledge management capabilities have a greater chance of boosting an entrepreneur's competitiveness through the collection, organization, and transformation of knowledge for use.

By creating a virtual, interactive environment, immersive technologies like virtual reality (VR) headsets have completely changed how we see the physical world. This technology has enormous promise in the educational sector to give students a secure and regulated setting

in which to experience real-world circumstances that could otherwise be harmful or impractical. On the effectiveness of using immersive technologies into the delivery of technical education, there is, however, little study. Over the past 10 years, a number of institutions have invested in centers for educational innovation with a focus on emerging technologies with the shared goal of furthering educational innovation. (Hidrogo et al., 2020). Virtual reality, blockchain, the internet of things, and artificial intelligence are a few of the most prevalent developing instructional technologies. Due to a number of factors, virtual reality in particular is at a vital stage for widespread use. Virtual reality has some qualities that make it a popular choice for use in teaching and learning in higher education; (i) as a technology tool, it may be directly integrated into the teaching-learning process. (ii) Because of its current technological maturity stage, hardware and software that can be used in educational settings have been developed. At the same time, expenses have typically decreased, increasing the viability of absorption within the educational framework. (iii) According to Hidrogo et al. (2020), it can increase students' curiosity. (iv) Additionally, for the majority of students, the university is the only location where they can use this technology. According to Broisin et al. (2017), and Paxinou et al. (2020), In addition to other fields of study, the education of natural, medical, and computer sciences is becoming more and more dependent on virtual environments.

2.2.5 Speed in Business Information Systems.

A Yankee Group (Yankee Group, 2018) poll indicated that, in addition to a lack of standards, cost and speed issues, m-commerce faces several problems as a nascent industry, particularly in the United States. Customers in the United States are unsure of whether they need or want mobile services, and many feel that the process is simply too

difficult.

Wang (2020), the most fundamental computer application task, particularly when it comes to data processing, is computer data processing. The speed of data processing, however, has a significant impact on the operation of the computer and some computer data processing speeds cannot satisfy people's normal expectations due to a variety of objective issues. The ability of computer data processing may be enhanced by in-depth study, and in use, the issues impacting the ability of computer data processing can be continuously improved.

2.3 Theoretical Literature/Framework

The theoretical underpinnings of the investigation were discussed in this section. The study was based on many assertions made by various academics across various subsets of business information systems:

Mollick et al.(2023), E-commerce is transitioning into a new phase known as mobile commerce as a result of excellent developments in telecommunications, communications technology, and wireless Internet. Consumers are no longer constrained by time or geography thanks to mobile commerce. In other words, consumers can execute transactions, do information searches, and make selections about their preferred products or services with merely a mobile device connected to the wireless Internet. With this benefit, mobile commerce is anticipated to grow significantly over the next few years. Consumers, corporations, and governments all gain from mobile commerce. Because companies do not need to invest heavily in creating physical branches or offices to do faceto-face business with potential clients, mobile commerce can firstly benefit companies by generating huge operational cost reductions. In other words, consumers can conduct informational searches,

engage with business websites, and make purchasing decisions about any desired good or service using portable devices (smart/mobile phones, tablets, or personal digital assistants) connected to the wireless Internet. The second benefit for firms is the opportunity for comprehensive integration with the local and global economy that mobile commerce provides. Our world is figuratively getting smaller because to technology, and national borders are becoming less distinct. There are no longer any boundaries in terms of time or place preventing interactions and exchanges between citizens and businesses of different nations. Without having a physical presence there, companies can produce in one nation and sell goods and services to residents of another. The third benefit for businesses is that consumers use smart/mobile phones to access social networks and discuss their shopping experiences as well as to buy and sell goods and services. In order to target a larger consumer base and reduce operating expenses, firms may also benefit from mobile commerce by using it to develop marketing plans and maintain customer relationships. The rise of mobile commerce as a motivator for the government forces it to increase investment in digital infrastructure in order to become a smart government. The smart government will, in turn, establish enabling conditions for mobile commerce to realize its full potential in satisfying the requirements and expectations of each economic actor. The economy will expand and develop sustainably as a result, and people's living standards and faith in the government will both rise. Although this is mostly accurate, the study was unable to demonstrate how mobile and electronic commerce benefit project management. The goal of this study is to determine what role mobile and electronic commerce play in the development of project management.

Market globalization necessitates fully documented corporate operations. Data and function coherences have gained prominence during the 1990s, taking the place of many disjointed and isolated solutions (Suryani and Perdana, 2016). As a result, manufacturing resource planning (MRP II), material requirement planning (MRP), and the new ERP planning have all undergone further refinement (Vakalfotis et al., 2019). ERP systems are application systems that improve all major functional areas of an organization's operational procedures. SAP, Oracle, and PeopleSoft are the three main vendors of worldwide ERP systems. According to Granlund and Malmi (2022), SAP is the clear market leader worldwide, followed by Baan, JD Edwards, etc. Any firm can expand the base system at any moment due to the constant development of enterprise systems modules (asset management, procurement, accounting and finance, materials management, personnel management, production, logistics, sales, etc.) (Ballantine et al., 2015). According to Jacobs and Weston (2017), ERP systems support horizontal organization and

standardization of business operations, which facilitates efficient planning and oversight of company activities. A centralized database, that holds all relevant company data and information, is used to consolidate key business activities (Sanchez-Rodriguez & Spraakman, 2013). The connection between, for instance, the customer master data, warehouse management, orders, accounts receivable and accounts payable is made via the central database. Real-time data, a unique user interface, automated business processes, and a centralized database are the main advantages of ERP systems (Wall et al., 2014). Within an organization, operational and strategic choices can be made more effectively and efficiently thanks to centralized and consistent data and information (Rikhardsson and Kraemmergaard, 2016). This is absolutely accurate; however, the research hasn't managed

to demonstrate how enterprise systems affect project management. The purpose of this study is to determine what role enterprise systems have in the development of project management across all its functional areas.

Segal, (2022) A decision support system (DSS) is a computer program that helps a business or organization's decisions, assessments, and courses of action. A DSS sorts through and analyzes enormous amounts of data, compiling precise information that can be utilized to resolve problems and make choices. Data is gathered, analyzed, and synthesized by a decision support system to produce comprehensive information reports. A DSS varies from a standard operations application, which only serves to collect data, in that it is an informational application. Either a human-powered or entirely computerized DSS is an option. It may occasionally integrate both human and computer-powered systems. The best systems analyze data and make decisions on the user's behalf. At the very least, they enable human users to make decisions more swiftly and thoroughly. Thanks to technological improvements, data analysis is no longer limited to large, cumbersome mainframe computers. Since a DSS is essentially an application, it can be loaded on the majority of computers, including desktops and laptops. Mobile devices can also access some DSS applications. Users who regularly travel benefit greatly from the DSS's flexibility. By having access to constant information, they are able to make the best decisions for their company and clients while on the go or even in the moment. Generally speaking, decision support systems aid in the making of more informed judgments in a variety of areas, from agriculture to medicine. Upper and mid-level management typically uses decision support systems to present a variety of potential outcomes based on recent and historical corporate data or to make important decisions. Additionally, reports that are easy to comprehend and can be

tailored to the needs of the user can be sent to clients via decision support systems. The study lists all the benefits that decision support systems provide, however it does not demonstrate how DSS improve project management. This study aims to determine how DSS influences project management's evolution across all of its functional domains.

Artificial intelligence systems are a vast and diversified group of systems that can mimic human decision-making for specific sorts of well-defined issues, according to Mathiyalakan (n.d.). Expert Systems' capabilities include strategic goal formulation, planning, design, decision-making, quality control and monitoring, and diagnosis. They can enable a novice to function at the level of an expert. By presenting fresh means of creatively communicating information, virtual reality systems have the ability to change the interface between people and information technology. Artificial intelligence, expert systems, knowledge management systems, and virtual reality are used in a variety of applications, such as credit granting and loan analysis, stock picking, apprehending cheaters and terrorists, budgeting, information management and retrieval, games, virus detection, hospitals, and medical facilities. If this study is significant in any way, it has failed to demonstrate how specialized corporate information systems are applicable to project management. The purpose of this study is to ascertain how business information systems have advanced project management.

Because IT is always changing, infrastructure and services must be developed quickly. An organization will swiftly fall behind the curve, lose potential revenue, and waste resources if it does not take quick action to capitalize on emerging technologies. It keeps the firm competitive, increases productivity, and develops a more effective support system for the company to have a quick-to-implement IT department (Vail, 2017). This study describes the rapid evolution of IT but does not provide the best technique to use to guarantee that a project

stays up with the always evolving IT without running into serious problems like cost overruns. The goal of this study is to establish the appropriate pace of IT accessory replacement needed to maintain a balance between cost and efficiency in a typical project.

2.4 Conceptual Framework

In order to construct a successful arrangement of literature, a conceptual framework describes the key ideas and principles from the relevant domains of inquiry (Dunn, 2010). The effects of the cause variables on the effect variable are clarified using conceptual frameworks. The study's primary objective was to examine how business information systems have contributed to project management's holistic evolution while taking into account the interactions among the dependent, moderating, and independent variables.

Independent Variables **Moderating Variable** **Dependent Variable**

Electronic and Mobile Commerce

*Geographical and Time Constraints Avoidance.

*Wider Audience Reach.

* Greater Stakeholder Engagement and Communication.

*Easy Usability and Quick Transactions.

Enterprise Systems

*Real Time Monitoring.

*Automated Management.

*Cost Efficiency.

*Faster Transaction Speeds.

Specialized Business Information Systems

*Simulation.

*Knowledge Management.

*Expert Systems.

*Artificial Intelligence

Information and Decision Support Systems

*Efficient-Speedy Decision Making.

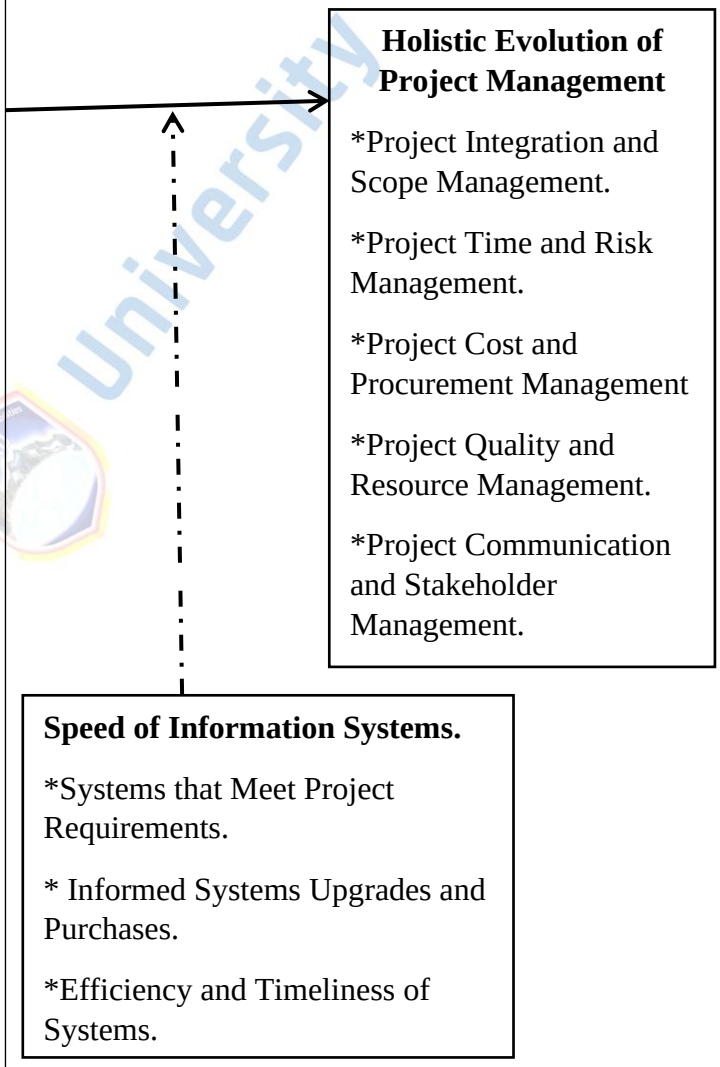
*Capability of Futuristic Decision Making.

*Interpersonal Communication.

*Encourages Learning and Training

Source: Researcher (2024)

FIGURE 2. 1: Conceptual Framework.



2.5 Recap

This chapter begins with an introduction, then moves on to examine the research questions with the help of a literature review in the sections titled Empirical Literature, Theoretical Literature, Conceptual Framework, and Recap. In an effort to identify the gap that business information systems would fill leading to a comprehensive evolution of project management, the areas covered include the contribution of electronic and mobile commerce, enterprise systems, information & decision support systems, and specialized business information systems.

Electronic commerce refers to any business transaction that is carried out electronically between businesses (business-to-business, B2B), businesses and consumers (business-toconsumer, B2C), businesses and the public sector, and consumers and other consumers (consumer-to-consumer, C2C). Mobile

commerce refers to the use of portable wireless devices for placing orders and carrying out business. Implementing these potent tools in project management improves a company's stock prices and market value and, most significantly, guarantees efficiency in managing projects. This is a huge deal that should be seized on to assure the holistic evolution of project management.

Enterprise systems encompasses systems for processing transaction and enterprise resource planning which records all enterprise transactions and necessitates real-time monitoring of business functions respectively. Incorporating these technologies in the management of projects ensures the ease and convenience in the day-to-day execution of project activities therefore the essence to embrace the technology towards the holistic evolution of project management.

Management information systems provide routine information to managers while decision support systems provide crucial information to support problem specific decision making. Owing to the fact that information is power and it is very crucial in the running of any project, undoubtedly is a must-have tech towards the holistic evolution of project management.

Specialized business information systems are the most contemporary techs which are proving to have numerous benefits which the field of project managements needs to tap to ensure accuracy and precision in projects which would be a great milestone towards the holistic evolution of project management.

Speed of information systems remains the all-time determinant for the efficiency of any system, therefore systems for any projects should be acquired or upgraded with the aspect of performance specifications and cost in mind. Having the expertise to determine the

costefficiency relationship in acquiring computer systems with the most ideal speeds for specific tasks is top tier towards the betterment of project management.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter details the techniques that will be employed in the collection of data, analyzing of the data and the presentation of the findings. It encompasses the research methodology, research design, location of the study, target population, sampling procedures and techniques, sample population, construction of research instruments, testing for validity, data collection methods and procedures, proposed data analysis techniques & procedures and Ethical considerations.

3.2 Research Methodology

This study employed experience survey research design which is the survey of people who have experience to the problem being studied therefore ensuring collection of systematic and accurate information from people who are competent in matters pertaining business information systems thus making sure to obtain information from different individual's experiences.

3.3 Research Design

This research was composed of one dependent variable, four independent variables and one moderating variable. The dependent variable is; Holistic Evolution of Project Management, the independent variables are: Electronic and Mobile Commerce, Expert Systems,

Information and Decision Support Systems and Specialized Business Information Systems while the moderating variable is the speed of information systems.

3.4 Location of the Study

This research was conducted at Karen Technical Training Institute for the Deaf which is a Science, Technology, Engineering and Mathematics(STEM) hub to evaluate how the incorporation of various systems in their various departments have contributed to the overall advancement of the institution as a whole. The institution is located in Nairobi County; Langata sub-county at Karen shopping center.

3.5 Target Population

A study population, according to Orodho and Kombo (2022), is the totality of instances that meet the criteria specified by a research study. The target population of this study were the top, middle and lower levels management staff of Karen Technical Training Institute for the Deaf (KTTID). According to the KTTID Human Resource Department, this population included individuals who are directly engaged in the acquisition, implementation and application of information systems including Finance department, administration, farm department, health department, robotics department etc.

Table3. 1: Target Population 1

Category	Target Population

Top Management:	06
*Assistant Principal –Academics.	
*Assistant Principal- Administration.	
*Finance Officer.	
*Systems Administrator.	
*Registrar.	
*Dean of Students.	
Middle Management:	15
*Head of ICT Department.	
*Head of Electronics and Electrical Department.	
*Head of Building and Civil Engineering Department.	
*Head of Mechanical Engineering Department.	
*Head of Business Department.	
*Head of Fashion and Textile Department.	
*Head of Institutional Management Department.	
*Head of Sign Language and Communication Department.	
*Head of Guidance and Counselling Department.	
*Head of Careers and Employability Department.	
*Head of Sports Department.	
*Head of Farm Department.	
*Head of Carpentry and Joinery.	
*Head of Examinations Department.	
*Chief Procurement Officer.	

Operational Management:	34
*Chief Security Officer.	
*Health Officer.	
*Bursar.	
*Farm Manager.	
*Assistant Heads of Departments-15.	
*Systems Maintenance Officer.	
*Information Systems Supplier.	
*ICT Trainers-5	
*Robotics Fair Coordinators- 8	
Total	**55**

Source: Researcher (2024)

3.6 Sampling Procedures and Techniques

The percentage of the study's population is referred to as the sample size. It characterizes as the process of selecting and scrutinizing a comparably small number of individuals, occasions, or things in order to learn about the total population. (Malterud, Siersma, & Guassora, 2016). The sample size is calculated using the Yamane (1969) equation. The following is how the equation is written:

$$n = \frac{N}{1 + Ne_2}$$

Where n= Sample Size

N= Population Size (55)

e= Sampling Error (5%)

Therefore $n = \frac{55}{1+55(0.0025)}$

n= 48 Respondents

A sample was taken from each stratum using a stratified and "simple random sampling technique" for the survey. According to Kothari (2014), stratified simple random sampling is a sampling technique where each component of the population stratum has an equal chance and likelihood of being chosen for the sample.

3.7 Sample Population

The sample size for each stratum obtained using the proportionate stratification estimate method created by Chin-Shun et al. (1996) is as follows when we utilize 49 total sample sizes. The following is the proportionate stratification estimation method;

$$nk=\left(\frac{Nk}{N}\right)*n$$

Where nk= Sample size of stratum k.

Nk= The Population Size of Stratum k.

N= The Total Population Size n=

Total Sample Size

In Table 3.2, the optimal sample size for the investigation is shown.

Table3. 2: Study Population 1

Category	Target Population	Sample Population
Top Management	06	5
Middle Management	15	13

Operational Management	34	30
Total	**55**	**48**

Source: Researcher (2024)

3.8 Construction of Research Instruments

This paper used a questionnaire and interviews as modes of data collection. The questionnaire was a semi structured one with a blend of open and closed ended questions. Closed ended questions facilitated the collection of structured data which was easy to tabulate & analyze as well as consistent while the open-ended questions necessitated collection of unstructured data with a wide range of information. The interviews were unstructured and conducted in person.

3.9 Testing for Validity and Reliability

According to Sekaran & Bougie (2016), the reliability and validity of the data collection equipment has a significant impact on how accurate the data is. The degree to which a result of data analysis accurately reflects the phenomenon being studied is known as validity. By including objective questions in the questionnaire, validity was guaranteed. Validity was tested by face validity test which involved asking experts on their view of the relevance of the study results. On the other side, reliability is a measurement of how consistently research tools produce outcomes (Sekaran & Bougie (2016). If a person receives the same score on the same test when it is administered twice, the instrument is seen to be trustworthy. Test for reliability was carried out using Pearson correlation between scores obtained from the same participants at two different time points.

3.10 Data Collection Methods and Procedures

Primary data was gathered for this study's fieldwork from KTTID information systems practitioners. The delivery of questionnaires served as the primary technique of data collecting, and oral interviews was used to supplement and confirm the information gleaned from the questionnaires. The exercise to collect the data was carried out in person as a walk-in exercise.

3.11 Data Analysis Techniques and Procedures

According to Miles et al (2013), the data analysis procedure entails the act of organizing the information gathered, placing it in chronological order, and beginning to write it in major components so that the findings may be readily and successfully communicated. There was editing, coding, and tabulation. After all the data was gathered, data cleaning was done to identify erroneous, incomplete, or inappropriate data. The quality was improved by fixing any errors and omissions that were found. Pie charts, tables, and bar charts were all used in the analysis of the data obtained, as well as other quantitative and qualitative methods.

3.12 Ethical Considerations.

The researcher obtained clearance from the University Ethical Review Committee of Mount Kenya University prior to beginning the fieldwork, as well as an introduction letter for the purpose of facilitating application for authorization from NACOSTI to gather data for the study, and maintained confidentiality at all times while conducting the study. Prior to participating in the study, the respondents' consent was sort, and anyone who was unwilling to provide specific information wasn’t forced, the responders were assured that the study is for educational purposes, and their participation will be voluntary. Additionally,

questionnaires were anonymous to prevent respondents from providing their personal information.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction.

The interpretation and presentation of the field research results are covered in this chapter.

The chapter provides background information about the respondents who were interviewed as well as the study's findings in relation to its objectives. Descriptive and inferential statistics have been used to discuss the findings. The study's goals were taken into account in the data analysis, presentation, interpretation, and discussion.

4.2 Research presentation, interpretation and discussions

4.2.1 Questionnaire Return Rate

This section analyzes the percentages and questionnaire return rates shown in Table 4.1.

Table 4.1: Questionnaire Distribution 1

Response Rate	Frequency	Percentage
Returned	39	81.25
Not Returned	9	18.75
Total	**48**	**100**

Source: Researcher (2024)

According to the data gathered, of the 48 questionnaires distributed, 39 were totally filled and returned, representing a response rate of 81.25%. This response rate is excellent for the aforementioned study. It's crucial for a researcher to base decisions on a study's response rate. According to Jack (2008), a response rate of at least 80% is necessary for a survey to be considered representative of the total population.

4.2.2 Profile of Respondents according to age group, gender, amount of education and length of service.

Age disclosure from the responders was requested. Table 4.2 details their responses.

Table 4.2: Respondents Age 1

Years	Frequency	Percentage
18-24	3	7.69
25-35	**7**	17.95
36-50	17	43.59
51>	12	30.77

Total	**39**	**100**

Source: Researcher (2024)

According to Table 4.2, the majority of respondents (43.59%) were between the ages of 36 and 50, followed by respondents above the age of 51 (30.77%), those between the ages of 25 and 35 (17.95%), and respondents between the ages of 18 and 24 (7.69%). The majority of personnel at Karen Technical Training Institute for the Deaf are above 36 years old, which served as justification for this.

The Participants were asked to specify their gender. Their responses are listed in Table 4.3.

Table 4.3: Respondents Gender 1

Gender	Frequency	Percentage
Male	27	69.23
Female	12	30.77
Total	**39**	**100**

Source: Researcher (2024)

According to Table 4.3, the majority of respondents—69.23%—were men, and the remaining respondents—30.77%—were women. Despite the fact that men outnumber women at the Karen Technical Training Institute for the Deaf, it was discovered that the gender ratio was all inclusive. This demonstrates that in order to gather accurate data about the topic of the study, the researcher took into account all respondents, regardless of their gender.

The participants were requested to list their highest level of education. Table 4.4 shows their responses.

Table 4.4: Participants Highest Academic Qualifications 1

Academic Qualifications	Frequency	Percentage
Diploma	10	25.64
Higher National Diploma	1	2.56
Bachelor's Degree	28	71.79
Total	**39**	**100**

Source: Researcher (2024)

According to Table 4.4, the study indicated that 71.79% of respondents held a degree, and 25.64% of respondents had a diploma. At 2.56% of the respondents, there were also individuals with a higher national diploma. This suggests that the majority of staff members understood the purpose of the research tool and most likely submitted accurate information.

The responders were asked about how long they had worked for the institution. Table 4.5 displays their responses.

Table 4.5: Respondents Length of Service 1

Years	Frequency	Percentage
1< year	3	7.69
1-2 Years	4	10.26
3-5 Years	6	15.38
6-10Years	7	17.95
10> Years	19	48.72
Total	**39**	**100**

Source: Researcher (2024)

According to Table 4.5, the majority of respondents, 48.72%, had worked for the institution for more than ten years. These respondents were followed 17.95% of employees who had worked there for six to ten years, 15.38% for three to five years, 10.26% for one to two years, and 7.69% for less than a year. This demonstrates that the majority of the respondents had worked for universities for over five years and beyond; as a result, the respondents had trustworthy and accurate information about the topic under study.

4.2.3 Mobile and Electronic Commerce contribution to the betterment of project management.

The initial goal was to ascertain how mobile and electronic commerce may improve project management at Karen Technical Training Institute for the Deaf. Using a likert scale from 1 to 5, respondents were asked to indicate their level of agreement with the statements supplied in order to address this aim.

Table 4.6: Mobile and Electronic Commerce contribution to the betterment of project management. 1

System	1	2	3	4	5	Mean	SDV
Mobile Commerce	0 (0.0%)	0 (0.0%)	1 (2.56%)	26 (66.67%)	12 (30.77%)	4.28	0.51
Electronic Commerce	0 (0.0%)	0 (0.0%)	0 (0.0%)	32 (82.05%)	7 (17.95%)	4.18	0.38
Electronic Business	0 (0.0%)	0 (0.0%)	0 (0.0%)	13 (33.33%)	26 (66.67%)	4.67	0.47

Composite Mean and S.D.V		**4.38**	**0.45**

Source: Researcher (2024)

Table 4.6 indicates that of the 39 participants in the survey, 12 (30.77%) highly agreed, 26 (66.67%) agreed, 1 (2.56%) were neutral, 0 (0.0%) disagreed, and 0 (0.0%) strongly disagreed with the significance of mobile commerce. The composite mean score of 4.38 and S.D. of 0.45 was higher than the mean score of 4.28 and S.D. of 0.51 for this statement. This suggests that the aforementioned claim does not advance project management. Consequently, this has to be examined or improved.

The statement regarding the contribution of electronic commerce received a mean score of 4.18 and S.D. of 0.38, which was lower than the composite mean of 4.38 and S.D. of 0.45. Of the respondents, 7(17.95%) strongly agreed with the statement,

32(82.05%) agreed, 0(0.0%) were neutral, and 0(0.0%) disagreed. This suggests that the aforementioned claim does not advance project management. This means that it needs to be reviewed or improved.

The statement about the contribution of electronic business received a mean score of 4.67 and S.D. of 0.47, which was higher than the composite mean of 4.38 and S.D. of 0.45. Of the respondents, 26 (66.67%) strongly agreed with the statement, 13 (33.33%) agreed, 0 (0.0%) were neutral, and 0 (0.0%) disagreed. This suggests that the aforementioned assertion favorably advances project management.

4.2.4Enterprise Systems contribution to the betterment of project management.

The second goal was to ascertain how much enterprise systems improved project management at Karen Technical Training Institute for the Deaf. Using a likert scale ranging from 1 to 5, respondents were asked to indicate how much they agreed with the statements provided in order to address this aim. Table 4.7 presents a discussion of the study's findings.

Table 4.7: Enterprise Systems contribution to the betterment of project management.
1

System	**1**	**2**	**3**	**4**	**5**	**Mean**	**SDV**
Transaction Processing Systems	0 (0.0%)	0 (0.0%)	0 (0.0%)	31 (79.49)	8 (20.51%)	4.21	0.40
Enterprise Resource Planning	0 (0.0%)	0 (0.0%)	0 (0.0%)	11 (28.21%)	28 (71.79%)	4.72	0.45
Composite Mean and SDV						**4.47**	**0.43**

Source: Researcher (2024)

Table 4.7 demonstrates that, of the 39 participants in the study, 8 (20.51%) strongly agreed, 31 (79.49%) agreed, 0 (0.0%) were neutral, 0 (0.0%) disagreed, and 0 (0.0%)

strongly disagreed regarding the contribution of transaction processing systems. Compared to the composite mean of 4.47 and S.D. of 0.43, this statement's mean score was lower, at 4.21 and 0.40, respectively. This suggests that the aforementioned claim does not advance project management. Consequently, this has to be examined or improved.

The enterprise resource planning statement received a mean score of 4.72 and S.D. of 0.45, which was higher than the composite mean of 4.47 and S.D. of 0.43. Of the respondents, 28 (71.79%) strongly agreed with the statement, 11 (28.21%) agreed, 0 (0.0%) were neutral, 0 (0.0%) disagreed, and 0 (0.0%) strongly disagreed. This suggests that the aforementioned statement will improve project management.

4.2.5 **Information and Decision Support Systems contribution to the betterment of project management.**

Finding out how information and decision support technologies may improve project management at Karen Technical Training Institute for the Deaf was the third goal. Respondents were asked to use a likert scale of 1 to 5 to indicate how much they agreed with the statements in order to complete this aim. The results of the investigation are presented in table 4.8.

Table 4.8: Information and Decision Support Systems contribution to the betterment of project management. 1

System	1	2	3	4	5	Mean	SDV
Management Information Systems	0 (0.0%)	0 (0.0%)	0 (0.0%)	23 (58.97%)	16 (41.03%)	4.41	0.49
Decision Support Systems	0 (0.0%)	0 (0.0%)	8 (20.51%)	25 (64.10%)	6 (15.38%)	3.95	0.60

Composite Mean and SDV		**4.18**	**0.55**

Source: Researcher (2024)

Table 4.8 indicates that of the 39 participants in the survey, 16 (41.03%) highly agreed, 23 (58.97%) agreed, 0 (0.0%) were neutral, 0 (0.0%) disagreed, and 0 (0.0%) strongly disagreed on the contribution of management information systems. Compared to the composite mean of 4.18 and S.D. of 0.55, this statement's mean score of 4.41 and S.D. of 0.49 was higher. This suggests that the aforementioned statement advances project management.

The statement about decision support systems had a mean score of 3.95 and S.D. of 0.60, which was lower than the composite mean of 4.18 and S.D. of 0.55. Of the respondents, 6 (15.38%) strongly agreed with the statement, 25 (64.10%) agreed, 8 (20.51%) were neutral, and 0 (0.0%) disagreed. This suggests that the aforementioned claim does not advance project management

4.2.6 Specialized Business Information Systems contribution to the betterment of project management.

The purpose of the fourth aim was to investigate how specialized business information systems have improved project management at Karen Technical Training Institute for the Deaf. In order to address this goal, the participants were requested to use a Likert scale ranging from 1 to 5 to indicate how much they agreed with certain assertions. The study's conclusions were presented in table 4.9.

Table 4.9: Specialized Business Information Systems contribution to the betterment of project management. 1

System	1	2	3	4	5	Mean	SDV
Knowledge Management Systems	0 (0.0%)	0 (0.0%)	0 (0.0%)	33 (84.62%)	6 (15.38%)	4.15	0.36
Artificial Intelligence	0 (0.0%)	0 (0.0%)	5 (12.82%)	6 (15.38%)	28 (71.79%)	4.59	0.71
Expert Systems	0 (0.0%)	0 (0.0%)	0 (0.0%)	23 (58.97%)	16 (41.03%)	4.41	0.49
Virtual Reality	8 (20.51%)	7 (17.95%)	21 (53.84%)	3 (7.69%)	0 (0.0%)	2.49	0.90
Composite Mean and SDV						**3.91**	**0.62**

Source: Researcher (2024)

Table 4.9 indicates that, among the 39 participants in the study, 6 (15.38%) highly agreed, 33 (84.62%) agreed, 0 (0.0%) disagreed, and 0 (0.0%) strongly disagreed about the contribution of knowledge management systems. Compared to the composite mean of 3.91 and S.D. of 0.62, this statement's mean score of 4.15 and S.D. of 0.36 was higher. This suggests that the aforementioned claim does advance project management**.**

The statement about artificial intelligence had a mean score of 4.59 and S.D. of 0.71, which was higher than the composite mean of 3.91 and S.D. of 0.62. Of the respondents, 28 (71.79%) strongly agreed with the statement, 6 (15.38%) agreed, 5 (12.82%) were neutral, and 0 (0.0%) strongly disagreed. This suggests that the aforementioned assertion favorably advances project management**.**

Expert systems had a mean score of 4.41 and S.D. of 0.49, which was higher than the composite mean of 3.91 and S.D. of 0.62. Of the respondents, 16 (41.03%) strongly agreed with the statement, 23 (58.97%) agreed, 0 (0.0%) were neutral, and 0 (0.0%) disagreed. This suggests that the aforementioned assertion favorably advances project management.

The statement about the contribution of virtual reality received a mean score of 2.49 and S.D. of 0.90, which was lower than the composite mean of 3.91 and S.D. of 0.62.

Of the respondents, 0(0.0%) strongly agreed with the statement, 3(7.69%) agreed, 21(53.84%) were neutral, 7(17.95%) disagreed, and 8(20.51%) strongly disagreed.

This suggests that the aforementioned claim does not advance project management. This indicates that a review or improvement is required.

4.2.7 Evolution of Project Management

The dependent variable was the evolution of project management. In order to address this goal, the participants were requested to use a Likert scale ranging from 1 to 5 to indicate how much they agreed with the statements provided. Table 4.10 presents the findings of the investigation.

Table 4.10: Evolution of Project Management 1

Statement	1	2	3	4	5	Mean	SDV
BIS has led to better coordination of activities within the scopes of the institute.	0 (0.0%)	4 (10.26%)	18 (46.15%)	14 (35.90%)	3 (7.69%)	**3.41**	**0.78**
BIS has facilitated better time and risk handling.	0 (0.0%)	0 (0.0%)	6 (15.38%)	31 (79.49%)	2 (5.13%)	**3.90**	**0.44**
BIS has eased the costing and procurement processes.	0 (0.0%)	0 (0.0%)	0 (0.0%)	16 (41.03%)	23 (58.97%)	**4.59**	**0.49**
BIS has facilitated improved quality assurance and resource management	0 (0.0%)	0 (0.0%)	6 (15.38%)	32 (82.05%)	1 (2.56%)	**3.87**	**0.40**
BIS have led to efficient communication amongst various stakeholders within the institute	0 (0.0%)	0 (0.0%)	0 (0.0%)	19 (48.72%)	20 (51.28%)	**4.51**	**0.51**
Composite Mean and SDV						**4.06**	**0.52**

Source: Researcher (2024)

Table 4.10 indicates that of the 39 participants in the study, 3 (7.69%) highly agreed, 14 (35.90%) agreed, 18 (46.14%) were neutral, 4 (10.26%) disagreed, and 0 (0.0%) strongly disagreed that BIS improved the coordination of operations inside the institute. Compared to the composite mean of 4.06 and S.D. of 0.52 for this statement, the mean score was 3.41 and the S.D. was 0.78 which was lower. This implies that the above statement does influence the evolution of project management but there is need for improvement.

The statement regarding the use of BIS to improve time and risk handling received a mean score of 3.90 and S.D. of 0.44, which was lower than the composite mean of 4.06 and S.D. of 0.52. Of the respondents, 2 (5.13%) strongly agreed with the statement, 31 (79.49%) agreed, 6 (15.38%) were neutral, and 0 (0.0%) strongly disagreed. This suggests that the aforementioned claim has an impact on how project management has developed. Improvement is therefore required.

The statement regarding the ease of the costing and procurement processes by BIS received a mean score of 4.59 and S.D. of 0.49, which was higher than the composite mean of 4.06 and S.D. of 0.52. Of the respondents, 23 (58.97%) strongly agreed with the statement, 16 (41.03%) agreed, 0 (0.0%) were neutral, and 0 (0.0%) disagreed.

This suggests that the aforementioned claim has an impact on how project management has evolved.

The statement "BIS has facilitated improved quality assurance and resource management" received a mean score of 3.87 and S.D. of 0.40, which was lower than the composite mean of 4.06 and S.D. of 0.52. Of the respondents, 1 (2.56%) strongly

agreed with the statement, 32 (82.05%) agreed, 6 (15.38%) were neutral, and 0 (0.0%) strongly disagreed. This suggests that the aforementioned claim has an impact on how project management has evolved. Improvement is therefore required.

on the statement BIS have led to efficient communication amongst various stakeholders, 20(51.28%) strongly agreed with the statement, 19(48.72%) agreed, 0(0.0%) were neutral, 0(0.0%) disagreed, while 0(0.0%) strongly disagree with the statement and it had a mean score of 4.51 and S.D of 0.51 which was higher than composite mean of 4.06 and S.D of 1.52. This implies that the above statement influences the evolution of project management.

4.3 Inferential Statistics

This section examines the relationship between the independent variables (Business Information Systems and the dependent variable (Evolution of project management)

4.3.1 Correlation

The study used correlation analysis, as summarized in table 4.11, to demonstrate the strength of the association between the dependent and independent variables

Table 4.11: Correlation 1

Variable	MCOM	ECOM	EBUS	TPS	ERP	MIS	DSS	KMS	AI	ES	VR	PMEVOL
MCOM	1											0.624
ECOM	0.501	1										0.598

E BUS	0.438	0.502	1									0.699
TPS	0.512	0.602	0.671	1								0.687
ERP	0.588	0.675	0.622	0.611	1							0.721
MIS	0.598	0.642	0.563	0.564	0.575	1						0.652
DSS	0.484	0.547	0.512	0.498	0.532	0.541	1					0.601
KMS	0.672	0.624	0.611	0.542	0.598	0.632	0.525	1				0.698
AI	0.589	0.572	0.661	0.647	0.625	0.611	0.597	0.528	1			0.749
ES	0.523	0.534	0.641	0.577	0.522	0.567	0.579	0.532	0.548	1		0.704
VR	0.541	0.498	0.514	0.521	0.509	0.506	0.487	0.471	0.456	0.548	1	0.584
PM EVOL	0.624	0.598	0.699	0.687	0.721	0.652	0.601	0.698	0.749	0.704	0.584	1

Source: Researcher (2024)

The correlation coefficients range from 0.584 to 0.749, indicating a strong positive relationship between each independent variable and project management efficiency.

4.3.2 Regression Analysis

A regression analysis was performed to further examine the relationship between the variables, as summarized in table 4.12.

Table 4.12: Regression Analysis 1

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
(Constant)	1.229		2.114	0.038
Mobile Commerce	0.197	0.218	3.611	0.001
Electronic Commerce	0.213	0.227	3.681	0.001
Electronic Business	0.189	0.211	3.241	0.002
Transaction Processing Systems	0.174	0.194	3.321	0.001
Enterprise Resource Planning	0.218	0.242	3.881	0.001
Management Information Systems	0.203	0.224	3.561	0.001
Decision Support Systems	0.186	0.207	3.201	0.003
Knowledge Management Systems	0.198	0.219	3.421	0.002
Artificial Intelligence	0.224	0.247	3.961	0.001
Expert Systems	0.211	0.233	3.801	0.001
Virtual Reality	0.168	0.186	3.111	0.004

Source: Researcher (2024)

The results indicated significant positive effects of all independent variables on project management efficiency, with p – values less than 0.05.

4.3.3 ANOVA Analysis

ANOVA (Analysis of Variance) analysis was conducted to evaluate the impact of various systems, including Mobile and Electronic Commerce, Enterprise Systems,

Information and Decision Support Systems, and Specialized Business Information Systems, on the enhancement of project management at Karen Technical Training Institute for the Deaf. This statistical method was utilized to determine whether there are significant differences in the contributions of these systems to project management effectiveness.

Table 4.13: ANOVA Analysis 1

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Statistic	P-Value
Between Groups	1.103	4	0.276	1.070	0.529
Within Groups	4.124	16	0.258		
Total	5.227	20			

Source: Researcher (2024)

- **F-statistic**: 1.070 • **P-value**: 0.529

Since the P-value (0.529) is greater than the common significance level of 0.05, we fail to reject the null hypothesis. This implies that there is no statistically significant difference in the means of the different groups. The contributions to the betterment of project management do not differ significantly across the various systems evaluated in the study.

4.4. Discussion of individual objective results. This is guided by the research objectives and research questions

The study sought to investigate the contribution of Business Information Systems towards the holistic evolution of project management with reference to: A case of Karen Technical Training Institute for the Deaf. The specific objectives of the study were; to assess the improvement of project management across all of its knowledge domains as

a result of employing electronic and mobile commerce in KTTID, to research the improvement of project management across all of its knowledge domains that enterprise systems have brought about in KTTID, to investigate how the fusion of information and decision support technologies has improved project management across all of its knowledge domains in KTTID and to study the improvement of project management throughout all of its knowledge domains, and the contribution of special business information systems thereto in KTTID .Thus, the discussion of findings of the study were based on the mentioned specific objectives.

4.4.1 Mobile and Electronic Commerce contribution to the betterment of project management.

The study found that Mobile and Electronic commerce contributes to the betterment of project management" moderately with a composite mean of 4.38. This was supported by Electronic Business with a mean of 4.67. This finding agreed with findings by the Gartner Group which predicts that consumer to business e-commerce will soon be possible using smart phones and mobile commerce technologies. According to numerous researchers, wireless and M-commerce will represent the next stage of development for electronic businesses (Ngai & Gunasekaran, 2017).

Understanding the potential effects on enterprises will be made easier with a quick review of the terminology and background information on mobile commerce. Another name for mobile electronic commerce, often known as wireless electronic commerce, is M-Commerce. Stafford et al., (2013), mobile commerce is anticipated to be the next gold rush after e-commerce, and numerous business groupings are vying for a piece of the action.

4.4.2 Enterprise Systems contribution to the betterment of project management.

The study found that Enterprise Systems contributes to the betterment of project management" moderately with a composite mean of 4.47. This was supported by Enterprise Resource Planning with a mean of 4.72. This finding agreed with findings by Bala and Venkatesh, (2013) which suggests that the ERP system is seen as a longterm plan by the customers that adopt it. Institutions can monitor and manage all of their resources and services with the help of ERP systems. To meet the specific requirements of the organization, ERP systems are tailored by the software vendors or developers. The adoption and successful integration of the finance, student management, human resource, and procurement modules can be attributed to the proportion of ERP implementation at Kenyan universities (Makokha, Musieg, and Juma, 2013).

4.3.3 Information and Decision Support Systems contribution to the betterment of project management.

The study found that Information and Decision Support Systems contributes to the betterment of project management" moderately with a composite mean of 4.18. This was supported by Management Information Systems with a mean of 4.41. This finding agreed with findings by Simplilearn, (2023) which suggests that a Project Management Information System is designed to assist all elements of project management, including information that must be monitored or collected. Project Management Information

System can be used for project quality management, project time management, communications management, project cost management, project scope management, project risk management, integration management and more.

4.4.4 Specialized Business Information Systems contribution to the betterment of project management.

The study found that Specialized Business Information Systems contributes to the betterment of project management strongly with a composite mean of 3.91. This was supported by Artificial Intelligence with a mean of 4.59, Expert Systems with a mean of 4.41 and lastly Knowledge Management Systems with a mean of 4.14. This finding agreed with findings by Juniper Research, (2018) which suggests that manufacturing, digital marketing, and healthcare are just a few of the industries where studies have already demonstrated the potential benefits of implementing AI. As product automation rises and industry adopts more AI and cyber physical systems, factories for manufacturing are projected to use AI widely (Wang & Wang, 2016). Researchers in the field of healthcare suggest employing AI systems connected to sensors worn by people to track and record their health (Rubik & Jabs, 2018). According to Juniper Research (2018), demand forecasting using AI will more than triple between 2019 and 2023, and chat bot interactions will increase from their present level of 2.6 billion to 22 billion in the same year.

The fourth objective was to examine the effect of specialized business information systems on the evolution of project management. It was found out that specialized business information systems influence evolution of project management moderately. It was supported by the above mentioned statements of knowledge management

systems, expert systems and artificial intelligence. A positive correlation was observed between the specialized business information systems and evolution of project management ($r=0.527$ $p< 0.01$). This is an indication that specialized business information systems had a statistically significant influence on evolution of project management.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The results of the data analysis and the conclusions drawn are the main topics of this chapter. It also contains comments and recommendations for more study on this subject. The researcher will be able to assess whether or not this goal has been achieved based on the data analysis results.

5.2 Summary of the Result Findings

Out of the 48 questionnaires distributed in the sample, a total of 39 were correctly completed and subsequently returned, yielding an impressive return rate of 81.25% for the study. Despite the fact that there are more men than women at Karen Technical Training Institute for the Deaf, the survey surprisingly discovered that the gender ratio among respondents was nearly the same. This finding underscores the researcher's commitment to inclusivity, as it demonstrates that all responders, irrespective of gender, were taken into account to gather accurate and comprehensive data on the topic of the study. Furthermore, it was revealed that the majority of the employees possessed bachelor's degrees and were over the age of 36 years. Additionally, the data indicated that a significant number of respondents had been employed by the Institute for more than five years. As a result, they were in a strong position to provide accurate and reliable information regarding the subject matter.

The first objective of the study was to determine the influence of mobile and electronic commerce on the evolution of project management in KTTID. The findings indicated that mobile and electronic commerce had a moderate influence on the evolution of project management. This conclusion is supported by previous statements regarding electronic business. A statistical analysis revealed that mobile and electronic commerce had a positive correlation with the evolution of project management ($r=0.650$, $p<0.01$). This correlation suggests that mobile and electronic commerce exerted a statistically significant influence on the evolution of project management practices.

The second objective was to assess the influence of enterprise systems on the evolution of project management within KTTID. The results indicated that enterprise systems also had a moderate influence on the evolution of project management, corroborated by earlier findings regarding enterprise resource planning. Statistical analysis demonstrated that enterprise systems exhibited a positive correlation with the evolution of project management ($r=0.603$, $p<0.01$). This finding implies that enterprise systems had a statistically significant impact on the evolution of project management methodologies.

The third objective focused on evaluating the influence of information and decision support systems on the evolution of project management in KTTID. The study found that information and decision support systems influenced the evolution of project management at a moderate level. This conclusion is backed by prior discussions regarding management information systems. Statistical analysis revealed that information and decision support systems also had a positive correlation with the evolution of project management ($r=0.636$, $p<0.01$). This suggests that information and decision support systems played a statistically significant role in shaping the evolution of project management practices within the institution.

5.3 Conclusions

A number of important conclusions were drawn from the comprehensive discussion presented above:

The study arrives at the modest conclusion that both electronic and mobile commerce significantly influence the evolution of project management practices. The integration

of mobile and electronic commerce into project workflows enhances the convenience and efficiency of costing and procurement procedures, making them more streamlined and accessible for project managers and stakeholders alike. Furthermore, the findings of the study indicate that enterprise systems exert a moderate yet noteworthy impact on the development of project management strategies. It was particularly evident that enterprise resource planning (ERP) systems played a crucial role in advancing project management at KTTID, primarily by facilitating improved resource coordination to effectively meet the diverse demands of the organization's multifaceted operations and projects.

The research also demonstrated that information and decision support systems have a moderate influence on the ongoing development of project management. By implementing robust management information systems, organizations can ensure that stakeholders consistently have access to timely and relevant information necessary for day-to-day operations. This access ultimately leads to enhanced resource management practices and improved quality assurance measures.

Moreover, the study concluded that specialized business information systems have a moderate impact on the evolution of project management methodologies. Utilizing knowledge management systems ensures that all project-related data is readily accessible, which in turn facilitates effective communication among stakeholders. The employment of expert systems guarantees that various operations are executed with precision, thereby enhancing quality assurance capabilities. The integration of artificial intelligence further ensures that a project remains contemporary and relevant across all operational scopes, adapting to changing conditions and requirements.

Finally, the study reached the conclusion that project management at KTTID had evolved to a moderate degree as a direct result of the integration of these advanced business information systems. The realization of many anticipated benefits has led to improved service delivery, increased operational effectiveness, and heightened productivity, marking a significant step forward in the organization's project management capabilities.

5.4 Recommendations for Practice

Based on the research outcomes, this comprehensive study strongly recommends that organizational leadership take full ownership of the integration of business information systems (BIS) by developing a robust policy framework that encompasses procurement, planning, and management. It is crucial for the authorities to ensure that even the components of BIS that scored below the average mean are implemented in their entirety to achieve the desired corporate objectives and generate maximum value. Additionally, organizations should prioritize the appointment of a competent and highly skilled systems manager who will lead and drive the business information systems implementation agenda within their institutions.

To further enhance the effectiveness of these systems, both BIS system vendors and implementing agencies must collaborate closely to identify, adopt, and utilize properly defined and proven methodologies, thereby improving the overall performance of business information systems. The research also emphasizes the importance of service users working in tandem with the vendors, particularly in providing constructive feedback about the system and fully utilizing its features. This collaboration is essential

to ensure that the implementation process reaches 100% efficiency, ultimately leading to the realization of optimum benefits from business information systems.

End users should actively seek to familiarize themselves with the essential skills required to operate BIS optimally, which will enable them to adapt to the continuous upgrades and enhancements of the systems seamlessly. Moreover, the study recommends that the systems maintenance team prioritize regular maintenance to ensure optimum functionality and promptly upgrade the systems to the latest versions. Furthermore, financiers should allocate a sustainable budget dedicated to covering the costs associated with the purchase, maintenance, and upgrades of these essential systems. Finally, the study underscores the necessity of vendor involvement throughout the system implementation phases, emphasizing the importance of considering both the vendor's capabilities and the strength of the vendor-customer relationship for a successful outcome.

5.5 Recommendations for Further Research

The study aimed at investigating the intricate relationship between business information systems and the success in the evolution of project management practices. For the purposes of this research, the evolution of project management was measured specifically at the Karen Technical Training Institute for the Deaf, focusing on the various operational activities and processes that are implemented within the institution. The findings derived from this study will provide valuable insights into the effectiveness of project management methodologies in this unique context. It’s imperative that similar studies are carried out in other regions and organizations across Kenya. Such comparative analyses would allow for a broader understanding of the

dynamics at play, ultimately leading to the development of empirical evidence that can be utilized to enhance the sustainability of donor-funded initiatives. By establishing a more comprehensive framework for understanding these relationships, stakeholders can make informed decisions that foster long-term success and viability in various projects aimed at community development.

REFERENCES

AlMuhayfith.s & Shait. H, (2020), Enterprise Resource Planning's Effects on Business Performance, 1st Edition, MDPI Publisher, Basel-Switzerland.

Ahmed.S, (2019), Project Management in Construction Using Augmented and Virtual Reality, Vol 11, Sciendo Publishers, Warsaw-Poland.

Bhatt.G & Zaveri. J, Decision Support Systems' Facilitating Function in Organizational Learning, Vol 2, Elsevier Publishers, Amsterdam-Netherlands.

Collins.C, Dennehy.D, Conboy.K & Mikalef.P, (2021), Research on artificial intelligence in information systems, Vol 60, Elsevier BV Publishers, Amsterdam-Netherlands.

Dharmendra. C & Niranjanamurthy. M. (2012), E-commerce and mobile commerce: problems and suggested screening, Vol 2, European Centre for Research Training And Development, United Kingdom.

Hardcastle, E. (2011), Business Information Systems, 1st Edition, Elizabeth Hardcastle & Ventus Publishing, Bangalore-India.

Hou.R, Ye.X, Zaki.H & Omar.N, (2023), Data mining-based systems for supporting marketing decisions, Vol 13, MDPI Publisher, Basel-Switzerland.

Kamau, J. & Onyango, T.,(2015) Research Referencing, 2nd Edition, Longonot Publishers, Nairobi-Kenya.

Kibuti.M.K, (2020), The Effect Project Management Practices Have on The Successful Installation of Enterprise Resource Planning Systems, 1st Edition. Not Published.

Mutiso, O.K. & Kiptoo S.C.,(2017) Understanding Research Fundamentals, 3rd Edition, Konza Publishers, Machakos-Kenya.

Maamar. Z, What Comes Next for Commerce, E-Commerce, and M-Commerce? Vol 46, Association for Computing Machinery Publisher, New York- United States.

Murad.M, Bashir.I, Shahzad.F, Ashraf.S & Li.I, (2020), Knowledge Management Practices' Effects on Organizational and Entrepreneurial Performance, Vol 11, Frontiers Publishers, Lausanne- Switzerland.

Naicker,V, Brijal.P & Bere.A. (2014), The Impact of Information Systems Usage on Productivity, 1st Edition, University of the Western Cape Research Repository, Cape Town – South Africa.

Oresi, S.N., Onchoke S.N. & Ombuna, G.N.,(2013) Making Research Simple, 1st Edition, Onchoke Publishers, Nairobi-Kenya.

Pham.L, Changchit.C, Cutshall.R & Mollick.J, (2023), Determinants of the Adoption of Modern Mobile Commerce, Vol 18, MDPI Publisher, Basel-Switzerland.

Reynolds.G & Stair.Ralph, (2012), Fundamentals of Information Systems, 6th Edition, Cengage Learning Publisher, Boston-USA.

Serrador.P & Turner.R (2015), The connection between project efficiency and success. Journal of project management, 46(1), 30–31, Wiley Online Library publishers, New Jersey-USA.

Stair.R & Reynolds. G, (2016), Information systems fundamentals, 8th Edition, Cengage Learning Publisher, Boston-USA.

Tashtoush, L. (2021), Journal of Information Systems and Informatics, 2nd Edition, DRPMUBD Publishers, Sydney-Australia.

Vicky, O.K, Nyabuku, N.M. & Matundra, P.B. Research History, 5th Edition, Sakawa Publishers, Kisii-Kenya.

Wang.L, (2020), Study of the Factors Affecting Computer Processing Speed, Vol 1648, IOP Publishers, Bristol-England.

Zaituni, X.M., (2012), Selecting a Research Plan, 1st Edition, Mshenangu Publishers and Printers, Mombasa-Kenya.

Research Plan, 1st Edition, Mshenangu Publishers and Printers, Mombasa-Kenya.

APPENDICES

Appendix 1: Introductory Letter

Dear Respondent,

Re: Data Gathering.

My name is Simon Kanyi, and I am a dedicated student currently enrolled at Mount Kenya University. At present, I am undertaking an important research study titled: "BUSINESS INFORMATION SYSTEMS CONTRIBUTION AND HOLISTIC EVOLUTION OF PROJECT MANAGEMENT: A CASE STUDY OF KAREN TECHNICAL TRAINING INSTITUTE FOR THE DEAF." This research aims to explore the significant impact that business information systems have on the overall development and improvement of project management practices, particularly within the context of educational institutions for the deaf. To facilitate this research effectively, your esteemed organization has been selected as a key

source to generate crucial data that will support my findings. I want to assure you that the information collected will be used solely for academic purposes, and your organization's name will not be disclosed in the study to maintain confidentiality. Furthermore, you will have the opportunity to access the findings of the study upon request, allowing you to see how your insights contributed to this important academic endeavor. Thank you for considering participating in this research.

Yours Sincerely

Simon .N. Kanyi

MSCPM/2022/50141

0712986059

Appendix II: Research Questionnaire

SECTION A: BACKGROUND INFORMATION

1. What is your age? Tick inside the box.

	18-24
	25-35
	36-50
	51 >

2. What is your gender?

	Male
	Female

3. What is your highest level of education?

	Diploma
	Higher National Diploma
	Bachelor's Degree
	Master's Degree
	Doctorate Degree

3. What duration have you worked at the institute?

	1< year
	1-2 Years
	3-5 Years
6-10>	Years

SECTION B: BUSINESS INFORMATION SYSTEMS CONTRIBUTION

Mobile and Electronic Commerce

To what degree does the following contribute to the betterment of project management? (Please tick only one option) (Where 1=Not at all, 2=Low Degree, 3=Moderate Degree, 4=High Degree and 5=Very High Degree).

System	**5**	**4**	**3**	**2**	**1**
Mobile Commerce (Use of portable devices to perform business functions)					
Electronic Commerce (Business transactions executed electronically)					
Electronic Business (Use of the internet to perform all business transactions)					

In what ways does Mobile and Electronic Commerce contribute towards the betterment of project management?

……

……

……

……

……

……

Enterprise Systems

To what degree does the following contribute to the betterment of project management? (Please tick only one option) (Where 1=Not at all, 2=Low Degree, 3=Moderate Degree, 4=High Degree and 5=Very High Degree).

System	**5**	**4**	**3**	**2**	**1**
Transaction Processing Systems(Records all completed business transactions)					
Enterprise Resource Planning(Automates and manages core business processes)					

In what ways does Enterprise Systems contribute towards the betterment of project management?

……

……

……

……

……

……

……....

Information and Decision Support Systems

To what degree does the following contribute to the betterment of project management? (Please tick only one option) (Where 1=Not at all, 2=Low Degree, 3=Moderate Degree, 4=High Degree and 5=Very High Degree).

System	5	4	3	2	1
Management Information Systems(Provides routine information to managers)					
Decision Support Systems(Provides information to solve problem specific decision making)					

In what ways does Information and Decision Support Systems contribute towards the betterment of project management?

……

……

……

……

……

……

……

Specialized Business Information Systems

To what degree does the following contribute to the betterment of project management? (Please tick only one option) (Where 1=Not at all, 2=Low Degree, 3=Moderate Degree, 4=High Degree and 5=Very High Degree).

System	1	2	3	4	5
Knowledge Management System (Creates, stores and shares organizations knowledge and experience)					
Artificial Intelligence (takes on the characteristics of human intelligence)					
Expert Systems (makes suggestions like an expert in a particular field)					

Virtual Reality (Simulations of a real or imagined environment)					

In what ways does Specialized Business Information Systems contribute towards the betterment of project management?

……
……
……
……
……
……
……..

Speed of Information Systems

To what degree does the speed of information systems (computer systems) affect the efficiency and cost of information systems? (Please tick only one option)

Not at all ☐ Low degree ☐ Moderate degree ☐ High degree ☐ Very high degree ☐

In what ways does the speed of information systems affect the efficiency and cost of information systems?

……
……
……
……
……
……
……

SECTION C: EVOLUTION OF PROJECT MANAGEMENT

To what degree do you agree with the following statements concerning the contribution of Business Information Systems in your organization? (Please tick only one option) (Where 1=Not at all, 2=Low degree,3=Moderate degree, 4 =High degree and 5=Very High Degree)

Statement	**5**	**4**	**3**	**2**	**1**
Business Information Systems has led to better coordination of activities within the scopes of the institute.					
Integration of Business Information Systems has facilitated better time and risk handling.					
Incorporation of Business Information Systems has eased the costing and procurement processes.					
Business Information Systems has facilitated improved quality assurance and resource management					
Business Information Systems have led to efficient communication amongst various stakeholders within the institute					

Appendix III: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **617523**

Date of Issue: **22/July/2024**

RESEARCH LICENSE

This is to Certify that Mr.. SIMON KANYI NJUGUNA of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: BUSINESS INFORMATION SYSTEMS CONTRIBUTION AND HOLISTIC EVOLUTION OF PROJECT MANAGEMENT: A CASE STUDY OF KAREN TECHNICAL TRAINING INSTITUTE FOR THE DEAF for the period ending : 22/July/2025.

License No: **NACOSTI/P/24/38134**

617523

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.

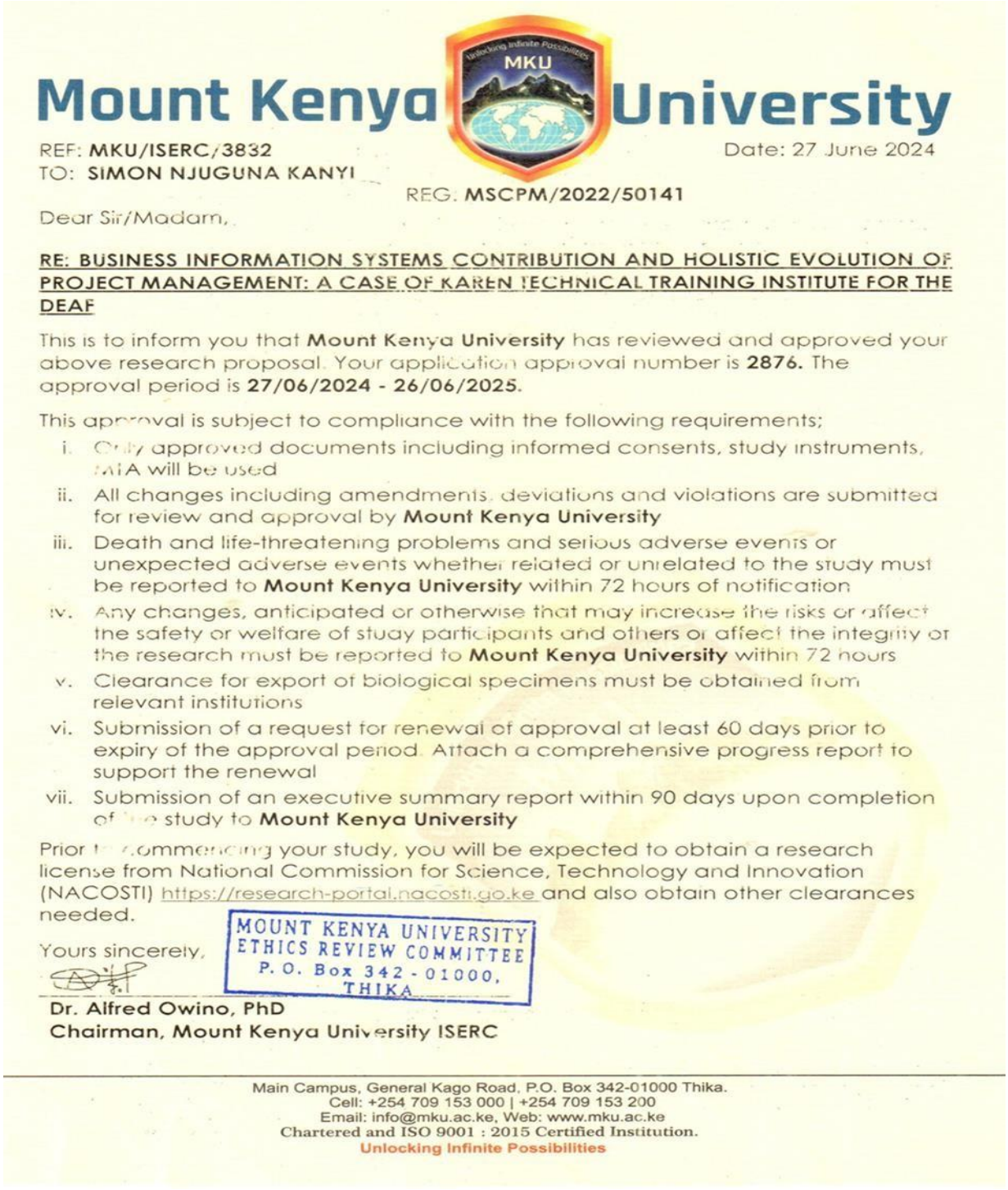
See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)

Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

Appendix IV: ERC Approval



Mount Kenya University

REF: MKU/ISERC/3832
TO: SIMON NJUGUNA KANYI

Date: 27 June 2024

REG. MSCPM/2022/50141

Dear Sir/Madam,

RE: BUSINESS INFORMATION SYSTEMS CONTRIBUTION AND HOLISTIC EVOLUTION OF PROJECT MANAGEMENT: A CASE OF KAREN TECHNICAL TRAINING INSTITUTE FOR THE DEAF

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2876.** The approval period is **27/06/2024 - 26/06/2025.**

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 **Mount Kenya University**
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 **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 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 **Mount Kenya University**

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 also obtain other clearances needed.

MOUNT KENYA UNIVERSITY
ETHICS REVIEW COMMITTEE
P. O. Box 342 - 01000,
THIKA

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 | +254 709 153 200
Email: info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.
Unlocking Infinite Possibilities

Appendix V: Letter of Introduction

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MSCPM/2022/50141

08th July, 2024

National Commission for Science Technology & Innovation (NACOSTI)

Off Waiyaki Way, upper Kabete,

P.O Box 30623- 00100 NAIROBI, KENYA

Dear Sir/Madam,

RE: SIMON NIUGUNA KANYI- REGISTRATION NO. MSCPW2022/50141

The purpose of this letter is to introduce the above named student who is pursuing Master of Science in Project Management in the Department of Management in the school of Business and Economics.

The title of the research is "Business Information Systems Contribution and Holistic Evolution of Project Management: A Case of Karen Technical Training Institute for the Deaf." It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between July,2024 and September, 2024.

Anv assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342 - 01000, THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies

Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. cell: +254 709 153 000 | +254 709 153 200

Email: info@mku.ac.ke, Web: www.mku.ac.ke

Chartered and ISO 9001 : 2015 Certified Institution.

Unlocking Infinite Possibilities

Appendix VI: Informed consent form

Title of the Study: Business Information Systems Contribution and Holistic Evolution 0f Project Management: A Case of Karen Technical Training Institute for The Deaf

Researcher: Njuguna Simon Kanyi **Introduction:**

You are warmly invited to participate in a research study that is being conducted by Simon Njuguna Kanyi from Mt. Kenya University. Before you make a decision regarding your participation, it is essential for you to comprehend the reasons behind this research and what your involvement will entail. Therefore, we kindly ask that you read this form thoroughly and do not hesitate to ask any questions you may have before deciding whether to take part in this study.

****Purpose of the Study:****

The primary aim of this study is to explore and analyze the influence that various technological systems have on the evolution of project management across all its functional areas. These systems include expert systems, artificial intelligence, knowledge management systems, special purpose systems, electronic commerce, transaction processing systems, mobile commerce, management information systems, and decision support systems. This research seeks to provide valuable insights that can enhance project management practices and improve outcomes in diverse organizational settings.

****Procedures:****

Should you choose to participate in this study, you will be asked to complete questionnaires and engage in oral interviews to provide the necessary information that the researcher requires. Your participation is entirely voluntary, and you have the freedom to choose not to participate or to withdraw from the study at any point without facing any penalties or negative consequences.

****Risks and Benefits:****

There are no known risks associated with participating in this study, aside from those that you might encounter in your daily life. However, your involvement may yield benefits,

such as the opportunity to apply the findings of the study to enhance project management practices within your institution and potentially foster improvements that could extend beyond your organization.

****Confidentiality:****

Rest assured that any information collected during the duration of this study will be handled with the utmost care and kept completely confidential. Your name will not be linked to any published results, and all data will be anonymized to protect your privacy.

****Voluntary Participation:****

Your participation in this study is entirely voluntary. You are free to withdraw at any time without facing any penalties or consequences. Your choice to participate or not will not impact your current or future relationship with the researcher or the institution.

****Contact Information:****

If you have any questions or concerns regarding the study, please feel free to reach out to Simon Njuguna Kanyi at +254712986059. Additionally, if you have inquiries about your rights as a research participant or if you need to report any research-related concerns, you may contact the Institutional Review Board (IRB) at Mt. Kenya University.

****Consent:****

By signing below, you indicate that you have read and understood the information provided in this form and that you voluntarily agree to participate in this research study.

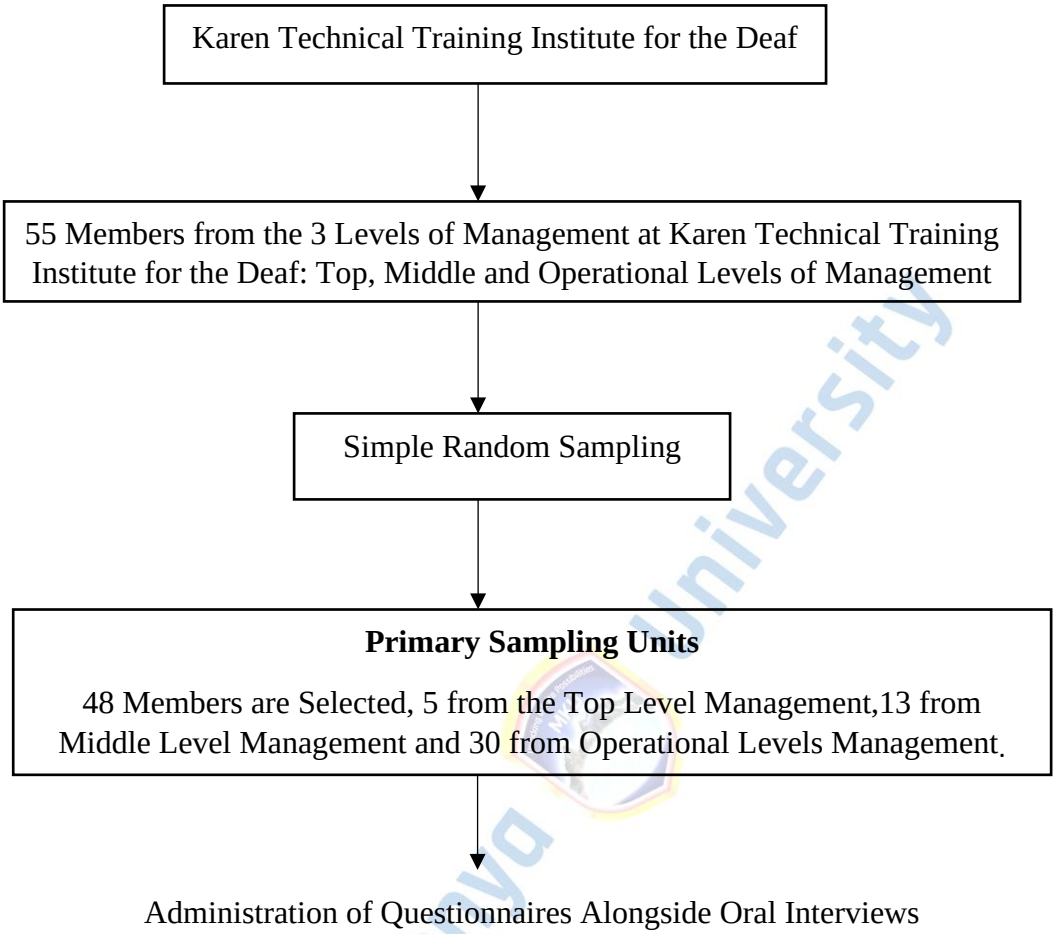
Participant Signature: _____

Date: _____

Researcher Signature: _____

Date: _____

Appendix VII: Map of Sampling Frame



Appendix VIII: Turnitin Report

simon Kanyi

NJUGUNA SIMON KANYI.docx

Thesis

Master

Mount Kenya University

Document Details

Submission ID
trn:oid:::1:3000358494

Submission Date
Sep 7, 2024, 12:38 AM GMT+3

Download Date
Nov 6, 2024, 5:05 PM GMT+3

File Name
NJUGUNA_SIMON_KANYI.docx

File Size
3.9 MB

104 Pages

21,338 Words

128,889 Characters

turnitin Page 1 of 116 - Cover Page Submission ID trn:oid:::1:3000358494

17% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Match Groups

- **267** Not Cited or Quoted 15%
  Matches with neither in-text citation nor quotation marks
- **26** Missing Quotations 1%
  Matches that are still very similar to source material
- **16** Missing Citation 1%
  Matches that have quotation marks, but no in-text citation
- **0** Cited and Quoted 0%
  Matches with in-text citation present, but no quotation marks

Top Sources

14% Internet sources
4% Publications
9% Submitted works (Student Papers)