EVALUATING THE USABILITY OF ENTERPRISE RESOURCE PLANNING SYSTEM ON ACADEMIC SERVICE DELIVERY AT MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY, KENYA

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BBM (MOI UNIVERSIYY)

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DECLARATION AND RECOMMENDATION

Declaration by the candidate

This research thesis is my original work and has not been submitted for a degree at any other University.

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Declaration by the Supervisors

This research thesis has been submitted for examination with our approval as University supervisors.

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DEDICATION

This research thesis is dedicated to my parents Philemon Tarus and Monica Tarus, my family my beloved wife Mercy and my children.

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I wish to acknowledge the following people for their various contributions towards the writing of this thesis. My supervisors: Dr. Ogalo James, Dr. Benard Maake, and appreciate Prof. Edmond Were. They ensured all correct steps were taken to attain this level. All my lecturers in the School of Information Science and Technology, Kisii University, Eldoret Campus. Their professional and technical advice cannot be overlooked. I also wish to acknowledge my wife Mercy for the critical corrections she made to this thesis. God bless them.

ABSTRACT

The ERP (Enterprise Resource Planning) It has been used for a long time at private higher education institutions as well as had a big influence on the management of finances and accounting, exams, accommodations and hostels, libraries, shops and procurement, and catering. Masinde Muliro University of Science and Technology has been experiencing problems with the ERP System installation since 2012. These problems have been mostly related to service delays caused by malfunctioning queuing systems or network delays, which have angered professors, students, and other staff members. Due to the low performance of the institution as a result, the study looked at how well Masinde Muliro University of Science and Technology's enterprise resource planning system functions in terms of providing academic services. The study's goal was to determine how well the business resource planning system (ERP) functionsed in relation to academic delivery of services at MMUST, Kenya. Specifically, the study set out to determine how well the ERP system functionsed in relation to navigation, how well it functionsed in relation to presentation, how well it functionsed in relation to security, and how well it functioned in relation to user learnability for academic service delivery. The Logistic Regression model, resource-based theory, and systems theory served as the study's guiding principles. The design of the case study was descriptive. 5226 responses, or 10 department heads, 37 technical staff members, and 5179 students, were the target population. The interview schedule and questionnaire were employed as tools for gathering data. Purposive sampling and stratified random sampling were employed. Using Krejc Morgan's table e (1970), the study determined that 408 respondents would make up the sample size. Self-administered structured questionnaires were used to gather data. By contacting the supervisor, the validity of the instruments was checked in order to improve the trustworthiness of the data. Pre-testing the tool at the University of Eldoret, where 44 questions were completed by faculty and students, helped to ensure reliability. Using Cronbach's alpha coefficient, it was determined if the instrument satisfied the 0.7 or higher requirement. Using SPSS version 2.3, data were examined using both descriptive and inferential statistics. The study aimed to examine the extent to which these usability factors impact academic service delivery. Results based on the model, logistic regression, is: System navigation satisfaction (-0.0889), system presentation satisfaction (0.1169), security satisfaction (0.0451) and user knowledge satisfaction (0.0592). Together, these factors lead to the conclusion that Masinde Muliro University of Science and Technology's academic service delivery is greatly impacted by the enterprise resource planning system. This implies that the management of Masinde Muliro University of Science and Technology should pay high premiums in strategically implementing and potentiating ERP to galvanize effective delivery of academic services.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ERP: Enterprise Resources Planning System

ICT: Information and Communication Technology

MMUST: Masinde Muliro University of Science and Technology

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Due to the widespread use of ERP solutions by many industries and organisations globally, users encounter obstacles related to usability along with user experience when utilising these systems. One of the most important factors that directly affects whether a software system succeeds or fails is its usability (Asif, AlFrraj, & Alshamari, 2022). Furthermore, end users' adoption of the project is significantly impacted by its usability. Users are unable to accomplish their objectives in the intended context of usage due to usability issues. Not only may poor usability cause large-scale projects to fail, but it also reduces the efficiency of the user's workgroup.

The increased globalization has prompted universities to be at the most pressurized receiving end, from reduced government funding to expectations by students to deliver quality services at minimal costs (Nerad, 2020). Therefore, academic service delivery through provision of quality data and information is an important factor for the success in higher education institutions. This has impacted on universities investing heavily in Enterprise Resources Planning (ERP) system in order to integrate and coordinate their activities for efficiency and effectiveness (Jepng'eno, Amuhayalravo, & Sakataka, 2016). Besides, an ERP is a commercial and configurable software package that is effective to institutions in managing and integrating all the information flowing through the functional areas in the system.

ERP system should be evaluated alongside the outcome indicators in addition to achieving the budget, schedule, and scope criteria. Product value, product use, and business value are the three (Chofreh, Goni, Klemeš, Malik, & Khan, 2020). In this study, success was determined in terms of service delivery in higher education. These metrics, when applied to ERP systems, consider system quality, use, and net benefits, and are linked to ERP system adoption.

An ERP system practice in higher learning institutions such as colleges and universities ensure commercial solutions for both administrative and academic usage.

Today's higher education institutions must contend with a plethora of issues, including worldwide competitiveness, shifting consumer preferences, and rapid technology advancements. Because of this, higher education administrators require information to manage daily operations, promote development, and eventually get a competitive edge. Technology is transforming the collection, handling, storing, sharing, and application of information. Information technology is used by almost all higher education institutions (Davenport, 2017). The digital economy—a product of the confluence of computation and telecommunications technologies—defines the dynamic framework of educational institutions. This is shown by the influence of internet access along with the World Wide Web, which has had a substantial impact on educational institutions and society at large.

1.1.1 Global perspective

The global evolution of information systems had been crucial to the different operational units and most critical functions of the learning institution. Integration of the various developed applications in the same institution coexists within the system, without any communication

between them. Integration of IS in institutions of higher learning necessitated the management of data on competition, services, students, lecturers and technological developments which was of great importance (Benavides, Tamayo Arias, Arango Serna, Branch Bedoya, & Burgos, 2020). More recent enterprise systems as ERP systems have been perceived by higher learning institutions as a solution to this problem (Mohamed Hashim, Tlemsani, & Matthews, 2021). Its adoption by the higher learning institutions will be beneficial. An integrated software programme called an ERP system is used to manage the resources and operations of an organisation. The various departmental demands are met by the institution's integration of every department and operations into one computer system.

In California, a huge number of higher education institutions want to take advantage of integrated ERP systems. However, the ERP system’s rate of implementation is quite low since only 33% of those implemented become successful thus there is still more to be done (Zadeh, Zolbanin, Sengupta, & Schultz, 2020). There are concerns as highlighted in the study by Ohio State University and University of Minnesota on the implementation of ERP systems being very expensive because the budget increased by 62% and did not produce returns immediately.

Higher learning institutions in Germany have adopted ERP systems, and are now enjoying the benefits where the students and lecturers can access the institution’s information such as courses offered, and the school library among others (Huang, & Palvia 2016). ERP system adopted by China’s higher learning institutions has improved the higher education in the country where students can learn online and access lecturers’ notes hence improving effectiveness and efficiency of the China institutions.

Learning institutions in Saudi Arabia has grown in recent years, which has led to a rise in interest in the implementation, administration, and application of educational management systems (LMSs). In the last several decades, there has been a significant development in technological innovation. Opportunities in various industries have been influenced by the information and communication technology' fast advancement. The development of IT services has moved beyond back office tasks to incorporate essential procedures in a variety of industries, including banking, education, healthcare, tourism, and many others. Although technological innovation is still advancing, there is now controversy over how to apply and integrate these advancements into education (Alshehri, 2021). Through the implementation of e-learning tools and services, the successful experience with e-services throughout the globe has led to a redefining of the function of educational institutions. The need for and chance to learn have been significantly impacted by this change. As a result, a significant amount of money and other resources have been invested by several educational institutions in the development and usage of e-learning systems. The objective is to provide a cost-effective, adaptable, and accessible educational environment that fosters lifelong learning across all temporal and geographic barriers. It is clear that communication has improved, as has learning and teaching, accessibility, mobility, and enrichment. Consequently, the application of e-learning technologies in education has become increasingly popular and has garnered attention on a global scale.

1.1.2 African perspective

ERP systems equipped higher learning institutions with a number of benefits, such as substantial tangible benefits, cost reduction, integration of data, thin personnel needed to run institutions and reduced information technology (IT) costs. There were also other several intangible benefits, such as improved internal processes, better customer service, and strategic enhancements (Wahjudewanti, Tjakraatmaja, & Anggoro, 2021). It has been described as exceedingly challenging to adopt the ERP systems in colleges and universities. ERP systems pose a challenge to organizations due to several aspects that are directly related to the three dimensions. First, inadequacy of qualified personnel has a direct impact on the ERP system's final utilization (Hajipour, Amouzegar, Gharaei, Abarghoei, & Ghajari, 2021). Second, organizational expectations do not meet system efficiency, and lack of confidence in data accuracy has a detrimental impact on the ERP system's "quality." Furthermore, the failure of firms to properly identify strategic goals, when combined with the latter elements, has an impact on the benefits that an ERP system may provide.

In developed countries, higher learning institutions often run into costly and sometimes unexpected difficulties with subsequent maintenance of ERP systems where users complain in access to information hence affecting the learning process especially when they want to know their subject’s marks and also on the enrolment of the school (Chaushi, Dika, Chaushi, & Abazi-Alili, 2019). The developing countries such as those in Africa like Ghana and Nigeria have tried to improve their learning process through advancing of technology in terms installing of proper ERP system hence making the users satisfied.

According to recent studies, higher education institutions in South Africa must adopt post-implementation measurement frameworks and evaluate the user experience of ERP technologies in order to positively impact user attitudes and acceptance of technology. Software for enterprise resource planning tools have been demonstrated to be at the core of Information Information Technology (ICT) in the fusion of various technologies with educational management systems, inside a structured paradigm (Stoltenkamp, & Siebrits, 2019).

An ERP system in Ghana that is built on only one, unifying integrated, including shared platform removes the obstacles to information exchange between all company and leadership activities and procedures. The primary function of an ERP system in boosting an organization's operational efficiency, procedures, and profitability is highlighted by the removal of barriers to communication and information exchange (Shanneb, 2020). The requirement for trained manpower in ERP usage has increased due to the expanding adoption and utilisation of the system. The literature review portion that follows provides an overview of the expanding possibilities for colleges and universities to include ERP instruction and training. Additionally, SAP is the preferred platform for ERP courses at the majority of institutions and universities. Under a subscription at a fair annual cost, the ERP Universities Alliance programme offers academic institutions a fully working ERP system for instruction and training

1.1.3 Local perspective

However, because ERP systems alter how various stakeholders carry out their duties, there is a great deal of opposition to these systems because they bring about significant as well as fundamental changes to organisational processes (Odoyo, & Ojera, 2020). Makokha, Musieg,

and Juma (2013) conducted a study on the ERP systems implementation at Masinde Muliro University of Science and Technology (MMUST) and found out that despite, integration of ERP systems being successful in most of the departments, based on the `, its performance in the students' affairs department was questionable.

All the same, ERP systems have changed how businesses go about supplying information systems. According to Bogonko and Ogalo (2019), they guarantee to offer an off-the-shelf solution for Kenyan organisations' information demands. The private higher learning institutions in Kenya are performing well through adopting ERP Systems hence increasing academic service delivery in Kenya public higher learning institutions have adopted ERP Systems but still, there is high increase of user complaints where they are enrolling for courses to pursue, checking their results among others hence affecting the performance of the institutions (Higher Learning Education Board Report, 2017). It is against this backdrop the study evaluated how the enterprise planning and management system affects the provision of academic services at MMUST.

1.2 Statement of the Problem

Higher learning institutions compete with each other to enrol students by providing convenient, accessible, and acceptable services and products to their students. The ERP System was introduced to facilitate service delivery and in particular address issues on information costs, service delays and client dissatisfaction (Nah, Zuckweiler, 2015).

The management of finances and accounts, exams, hostels and accommodations, libraries, procurement and stores, catering (pay as you go), SMS integration, timetable management,

and fixed assets management have all been greatly impacted by the long-term adoption of the ERP system in private higher education institutions. The adoption of this system in public universities has, however, encountered resistance manifested in user complaints which have affected institutional operations (Gargeya & Brady, 2015).

The Masinde Muliro University of Science and Technology's ERP System deployment since 2012 has been marked by complaints from instructors and students, particularly over service delays brought on by malfunctioning queuing systems or network outages. According to Makokha, Musiega and Juma, (2013), this has led to poor institutional performance in terms of lateness in course registration, delayed fee payments, irregular library areas, checking results, and other school programs. These are symptoms of the ERP system deficiencies that can be attributed to the ERP communication system, user rigidity, information security and user knowledge. This has led to a decrease in institution performance (Higher Learning Education Board Report, 2017).

The purpose of this study was to assess how well Masinde Muliro University of Science and Technology in Kenya's academic service delivery uses an enterprise resource planning system. Research on the use of ERP systems in higher education has been scarce. In their research, Ujunju, Wanyembi, and Wabwoba (2012) reaffirmed the role of technology in providing encourage towards processes of management in higher education institutions; Wabwoba and Mwakondo (2017) investigated the use of trained neural networks in the selection of pupils during university course admission at the Joint Admissions Board (Kenya). Makokha, Musiega, and Juma (2013) investigated the setup of software for enterprise resource planning in Kenyan public universities. Other studies have focused on other industries for instance

Panga (2014) studied the major influencing factors to the implementation of enterprise resource planning in firms at a geothermal development company in Nairobi, Kenya; Muthoni (2014) focused on factors influencing implementation of enterprise resource planning in the mobile communications sector in Kenya; Malonza and Nduki (2014) evaluated determinants which influenced adoption of enterprise resource planning systems by listed companies in Kenya; and Muysimi and Odongo (2015) assessed the adoption of enterprise resource planning systems on manufacturing firms in Nairobi Metropolitan.

One of the areas that poses a gap in knowledge in both academia or practitioner literature is; the usability of ERP systems and other large-scale enterprise systems.

Extensive research has been there on ERP systems, however, most weight has been put more on the issues affecting the success or failure of ERP implementation instead of focusing on the factors that affect usability. According to ISO 9241-11 (1998, P.2), usability is defined as, "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use". User interaction in accomplishing their activities is the main focus within a particular environment. In higher learning institutions ERP usability can be defined as per the ability of the users in an effective, efficient and satisfactory to complete different tasks with the ERP.

In response to this realisation, the research at Masinde Muliro University of Science and Technology looked at the usefulness of the enterprise resource planning system on the provision of academic services in an effort to close this gap.

1.3 Purpose of the Study

The purpose of this study was to evaluate the usability of ERP system supporting academic service provision in MMUST.

1.4 Objectives of the Study

The study was guided by the following objectives:

i. To identify the usability mishaps that affect usage of ERP systems in supporting academic service provision at MMUST.

ii. To design a mechanism to improve usability of ERP system in supporting academic service provision at MMUST.

iii. To evaluate the proposed design of ERP system in academic service provision at MMUST.

1.5 Research Questions

The study sought to answer the following questions;

i. How does usability mishaps that affect usage of ERP systems in supporting academic service provision at MMUST?

ii. What is design of mechanism to improve usability of ERP system in supporting academic service provision at MMUST?

iii. What is proposed design of ERP system in academic service provision at MMUST?

1.6 Significance of the Study

The introduction of ERP Systems into the learning industry has affected service delivery in the service industry. Many higher learning institutions are shifting from the traditional way of delivering their services to students and other stakeholders to introducing ERP Systems into their service delivery. This study focuses on Human-Computer Interaction (HCI), which is a multidisciplinary area of study centering on the design of computer technology (ERP) and, more so, the interaction between end-users (university stakeholders) and computers. The study can be of great significance to the following respondents.

Management of Masinde Muliro University of Science and Technology

The institution will benefit from the study's conclusions and suggestions as they list the opinions that users have regarding ERP systems. Since the primary focus of higher education institutions is on the happiness of ERP users, this study will add to our understanding of how to improve these services. Furthermore, by looking at service quality, the research will allow the university to assess its success based on what consumers think of it.

Students of Masinde Muliro University of Science and Technology

The study can be beneficial as it is of importance to the students and the institution in general. The outcome of the study can provide evidence for institutions to improve their service delivery and the performance of student care units that are fine tuned to the comfort and satisfaction of the students.

Researcher

The study can be of great benefit to the researcher to know the factors affecting ERP Systems and how it affects academic service delivery and how the institution ought to improve the performance of the ERP Systems.

Scholars and Academicians

The long-term goal of the study is to contribute to developing a set of designed principles and applications to which improvement in the usability of ERP systems will be attributed. The study's findings can be useful to academics and scholars as they can serve as a foundation for future investigation.

1.7 Scope of the Study

Masinde Muliro University of Science and Technology was the study's location. The study's scope was restricted to particular factors that assess how well systems for enterprise resource planning work in the provision of academic services. These variables are usability of ERP system navigation; system presentation; security; and ERP system learnability. The study took a period of 6 months (February to August, 2018).

1.8 Limitation of the Study

The researcher found that several participants withheld information throughout the data gathering process because they were afraid of the higher authorities in the organisation taking offence. In order to prevent victimisation, the researcher had to reassure the respondents that the information they provided would not be disclosed. Some respondents might not have supplied accurate information; instead, they might have provided erroneous generic or

anonymous data. The researcher used a combination of closed-ended and open-ended questions to address this issue.

1.9 Conceptual Framework

The framework conceptualizes the usability of enterprise resource planning system as an independent variable while academic service delivery is the dependent variable. The Enterprise resource planning system plays a vital role in higher learning institutions since it provides information to the students such as fee structure, subjects' marks, and, courses offered among others. For an enterprise resource planning system to perform effectively and efficiently is determined by the following factors effectiveness of system navigation; level of presentation; security; and learnability.

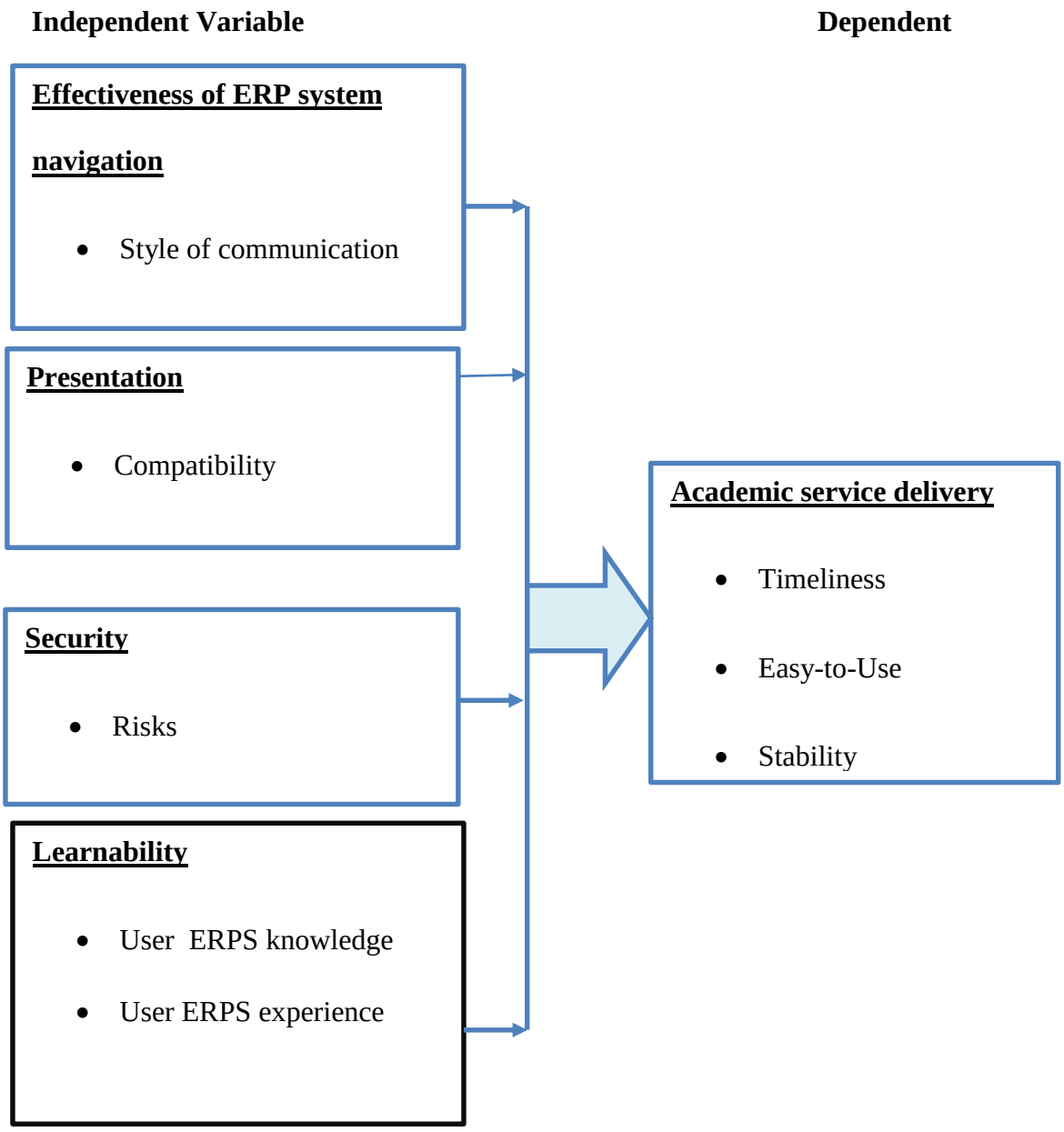


Figure 1. 1 Conceptual Framework

Source: (Author, 2018).

1.10 Operational Definition of Terms

Academic service delivery: It is the performance of teaching, research, and community service activities by academic department in furtherance of the mission of MMUST.

Enterprise Resources Planning (ERP) System: Organisations utilise this software system to help automate and integrate most of their business operations, produce and retrieve information in real-time, and share common data and procedures throughout the organisation.

Presentation: ERP system can give feedback to the potential internal or external changes that impinge on its value delivery in a timely, and pocket friendly manner.

Security: It is where the ERP system is safeguarded by the utilisation of a specialised network that includes rules and procedures against data loss, theft, interception, corruption, and unauthorised access.

System Navigation: It is the process through which users move around the ERP system interface in institutions of higher learning.

Learnability: ERP easy-of-learning. How easy it is for users to accomplish fundamental tasks upon their first encounter with the design.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter undertakes review on scholarly work relating to the area of study. The thematic reviews are derived from the research objectives. Additionally, the study presents the theoretical reviews with the theories that guided the study reviewed.

2.2 Empirical Review

2.2.1 Usability mishaps that affect usage of ERP systems in supporting academic service provision at MMUST

All businesses, regardless of size, have to invest in ERP Systems to achieve an edge in the modern global market. In general, end consumers in these companies encounter poorly designed user interfaces and unusable technologies (Prasetyo & Soliman, 2021). The impact on information complexity and how it is presented to end users of ERP software was examined in the study using data collected from the project managers who managed and implemented both types of software. The ability to achieve full productivity is underutilized despite the promises of huge benefits from using ERP software. One reason for this is a lack of investment in software ergonomic measures.

Although a rising number of individuals use ERP systems on a regular basis, their usability is still poor. They frequently require complicated operation. Customers' discontent with poorly designed systems may lead to ineffective use of the product. The best people to address these usability concerns are the suppliers of ERP systems, but during the deployment process, there

is a chance that the client will have an impact on the system's usability. Through the use of Zoom, three semi-structured interviews were used to gather primary empirical data. Forms were used to collect more empirical data (Paulander, 2021). A review of the literature for the study revealed that several usability factors might be impacted at various stages of an ERP deployment process. It was also discovered that the aforementioned firm had some influence over usability during the deployment phase. Nevertheless, the business did not take some usability factors into account when putting ERP systems in place.

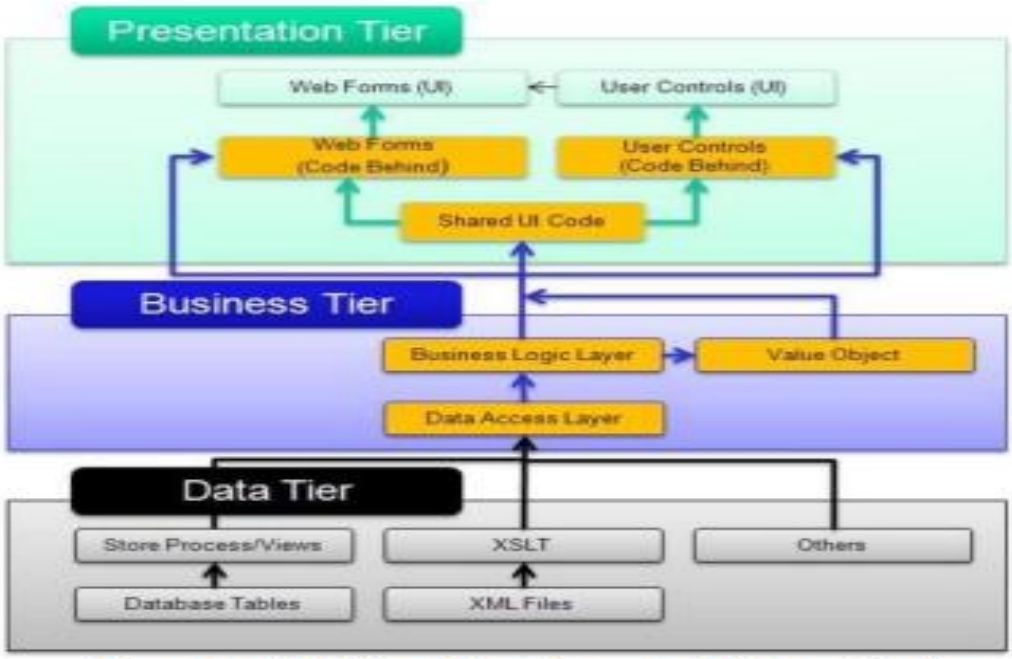


Figure 1. ERP Three Tier/Layer Architecture Design Components.

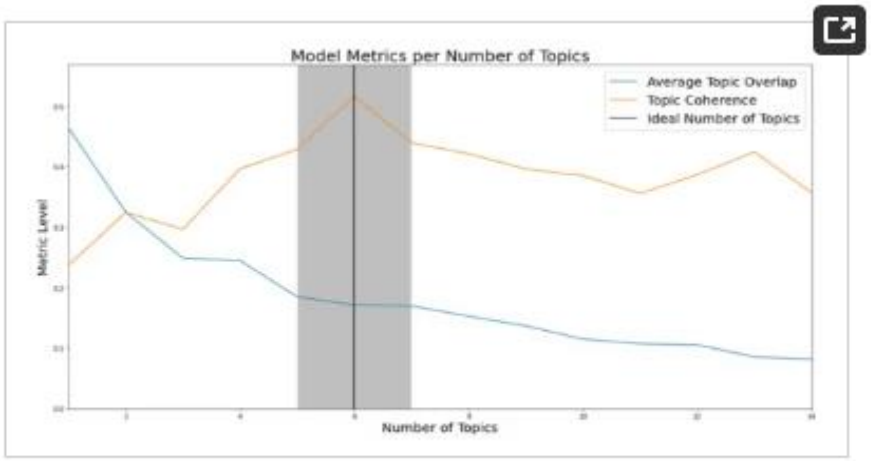
Source: Paulander, (2021)

The study employed architecture design to check the ERP software architecture to know usability evaluation of ERP systems in comparing between SAP S/4 Hana & Oracle Cloud while the current study looked into ERP complications in application to academic sector.

Enterprise resource planning systems are sophisticated systems that handle corporate activities in real time. The purpose of deploying an ERP system is to improve company process efficiency. However, bad usability can reduce the efficiency of employees who use the system. There are numerous approaches for assessing system usability. For this investigation, three techniques were considered. User tests were carried out in order to get qualitative data. Six participants took part in the user testing. The system usability scale and Walk Me were employed to collect quantitative data (van den Dries et al., 2021). The survey revealed that users want to be able to personalise the system's views, that customers and accountants have distinct demands from one another when it comes to ERP systems, and that users prefer to take the familiar path while navigating the system.

The ERP system, which is widely employed by businesses to automate their workflows, has a significant impact on how well such businesses perform. ERP system usability problems could result in performance degradation and cost the organization money. Numerous studies in the past have noted numerous usability issues with ERP systems. To prevent recurring usability issues with ERP systems, it can be useful for developers and designers to use design advice as a quick reference (Asif, AlFrraj, & Alshamari, 2022). Effective data consolidation of the previously stated usability issues is currently lacking in this area. The study provided a novel method for applying the topic modelling technique to create an accurate checklist of ERP usability issues. Six distinct usability problem-related issues that are applicable to different ERP systems were identified by the study. The most common usability issues include missing

data and information, error handling, and difficulties looking for and locating needed items or information in an interface.



The measurements of an optimal number of topics of usability issues from the input dataset.

Source: Asif, AlFrraj, and Alshamari, (2022)

However, the study employed model matrics to explore usability problems in enterprise resource planning systems to know problems encountered in the implementation of ERP systems while the current study will look into mix-ups encountered while implementing ERP systems in supporting academic provision.

A sophisticated and all-inclusive piece of software, the enterprise planning and management system unifies several corporate resources and operations. Despite being portrayed as an answer in many organisations, there are a lot of unfavourable findings on the effectiveness, advantages, and impact of ERP systems on user satisfaction (Omieno, 2020). Although enterprise resource planning (ERP) systems have been extensively researched over the past 10 years, they frequently fall short of the initial expectations for advantages. Their inability to

comprehend user requirements is one important factor in their failures. Numerous research investigations have been carried out to provide software quality models along with their quality attributes. Nevertheless, there isn't now a specific quality assurance model that can incorporate new ERP system capabilities and characterise usability maturity.

An enterprise resource planning system, also known as cloud ERP allows businesses to connect over the Internet as it operates on the cloud platform of the vendor rather than an on-premises network (Salih et al., 2021). Critical success factors, or CSFs, in the acceptance and deployment of on-premises ERP have been extensively studied; on the other hand, no prior study has been done on CSFs in the adoption of cloud ERP. The discovery and evaluation of 16 CSFs by means of a systematic review of the literature, in which 73 publications on the cloud ERP adoption were evaluated using criteria for inclusion and exclusion from a variety of conferences and journals, is what this research contributes to. The study discovered that the three most frequently mentioned critical issues for the use of cloud-based ERP were security, usability, and vendors.

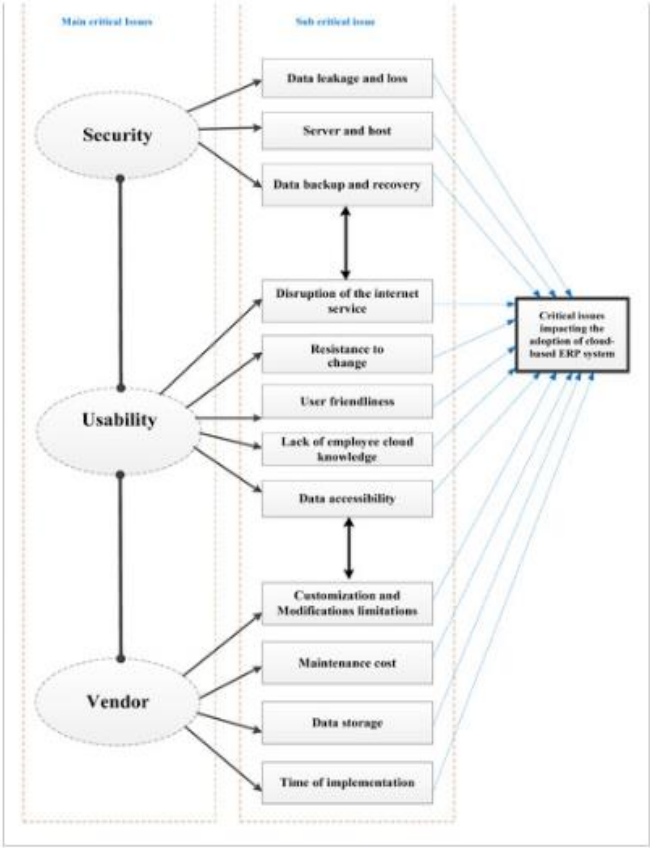


Figure 5. The integrative model for the critical issues in the adoption of cloud-based ERP systems from security, usability, and vendor perspectives.

Source: Salih, *et.al.*, (2021).

However, the study prioritised organisational aspects influencing cloud ERP uptake and the crucial concerns pertaining to protection, usability, and suppliers using an integrative model. It concluded that guaranteeing cloud security of the system is an essential component of the acceptance and implementation of CERP. Since information security encompasses a range of techniques to prevent unauthorised access and data destruction, data protection along with information protection are two essential components that must be taken into account while adopting CERPs. Usability problems are also among the main concerns that might hinder

CERP implementation. Furthermore, for small enterprises without organised legal teams, the legal issues surrounding data privacy might be particularly challenging with regard to vendor controllers in cloud ERP systems. Since CERP suppliers are in charge of updates, server administration, maintenance, and backups, these worries mostly apply to them, even though the current study focused on usability issues with ERP installation in academic settings.

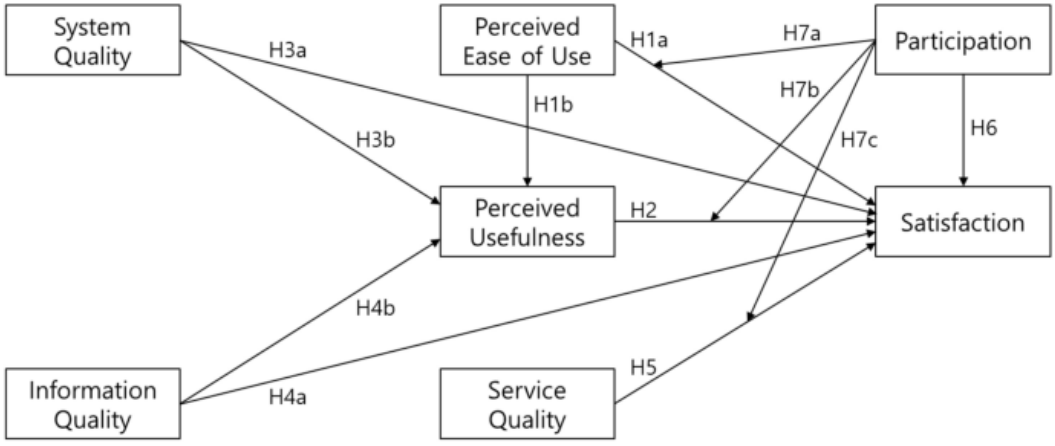
ERP adoption is directly impacted by organisational and technological variables. The study employed multiple group modelling to investigate the potential impact of the institute's size as a grouping variable on the structural equation model's equations pertaining to the variables observed (Dabholkar & Date, 2021). The literature on the moderating impact of higher education institute size on ERP performance is lacking. The link between organisational, technical, and ERP usage that adds value to higher education institutions is moderated by the institutions' sizes. To guarantee a successful ERP deployment in higher education institutions, the model may be utilised as a reference.

2.2.2 Mechanism to improve usability of ERP system in supporting academic service provision at MMUST

These days, enterprise resource planning solutions are found in most contemporary businesses. The study's main subject was a sizable marine and shipbuilding firm that used an ERP system. Online questionnaires were used to gather data from those taking part, a sample of 234 ERP users who were carefully chosen by the executives and practitioners of the organisation. purposeful sample of employees at major maritime engineering and shipbuilding companies using ERP software (Jo, & Park, 2023). The data was analysed using a partial minimal squares model of structural equations (PLS-SEM). Perceived usefulness had no discernible effect on

user happiness, according to the data, but perceived convenience of usage, system quality, level of service, and involvement did. It's interesting to note that involvement was shown to mitigate the impact of perceived worth on satisfaction. According to research, managers should work to improve the ERP system's stability and usability, promote employee involvement in decision-making, and strengthen the support team's position in order to increase ERP user happiness.

Figure 1



Research model.

Source: Jo, and Park, (2023)

The present investigation focused on mechanisms to increase the usability of the ERP system to promote academic offering, while a research model was employed to establish mechanisms for effective management of business resources planning from user data handling and system quality perspective. Unlike this study, the study concentrated mostly on management and system quality.

For organisations to successfully keep records and transactions, automated solutions are essential. Enterprise Resource Planning (ERP) solutions, which offer integrated, real-time process and transaction management, are becoming more and more popular among universities. ERP systems are multi-user databases that are accessible by a number of users, often using password authentication and usernames. ERP systems, which typically solely employ the conventional authentication mechanism of a password and username, have raised security and privacy problems, nevertheless. There are vulnerabilities in passwords that make them readily cracked (Kimani, 2022). An exploratory sequential approach and a survey of Kenyan universities with charters were employed in the study. The process of gathering data involved document analysis and online questionnaires sent to the system administrators of the institutions in order to identify ERP authentication techniques and weaknesses. Password guessing, password reuse, and social engineering were the main weaknesses identified by the study; as a result, a multifactor authentication prototype was suggested to mitigate these risks. Attack tolerance, user training, and ICT security policy were the independent variable components that were determined to have a statistically significant link with ERP system security based on the correlation. According to the regression analysis model, the most important factor influencing increased ERP system security was user training. In order to increase the safety of an ERP system for Kenyan institutions, this research therefore suggested and constructed a multifactor authorization prototype weighing in these characteristics. The study's ultimate product was a multi-factor authorization prototype that combines biometric and password authentication. To improve ERP system security for Kenyan colleges, this

prototype must be combined with user training that is effective and the implementation of ICT security rules.

All organisations experience resistance to change, but it is almost always a necessary measure that needs to be carefully considered and analysed. For this reason, it will be important to identify the primary reasons why resistance to change occurs while on the setting up of a fresh company's resource planning system in order to prevent it and identify the best ways to address it (Azouri, Harb, Chaaya, & Akoury, 2022). Using a survey of one hundred respondents using quantitative, deductive, positivist methods, the study concluded that the issue could have started with the trainers and providers who did not adequately pass the knowledge to the consumers. A crucial element in guaranteeing worker satisfaction with the recently installed technology will be communication. Maintaining communication between the management and the staff members and trainers is also necessary. Effective communication is crucial between management, the workforce, providers and management, educators and management, and trainers and employees. It can lessen the severity of challenges, complications, and change resistance, which can lower costs and boost performance.

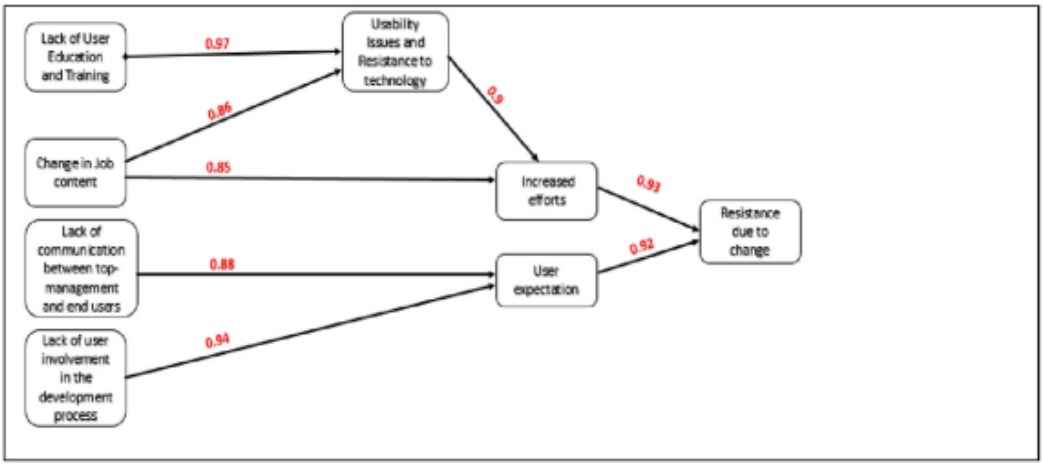


Fig. 2. Module of user resistance in post ERP implementation and the influence percentage between factors.

Source: Azouri, Harb, Chaaya and Akoury, (2022).

The user resistance assessment tool was utilised in the study to identify the variables that contribute to change resistance while implementing systems for enterprise resource planning. The current study, however, concentrated on ways to enhance ERP usability in order to complement academic offerings.

2.2.3 Proposed design of ERP system in academic service provision at MMUST

An open ERP system and experiential learning theory are used in this study's creation and assessment of an enterprise resource planning (ERP) design course, which offers students an all-inclusive, free-of-charge learning environment. The educational framework was designed with the intention of assisting students in gaining the requisite information and gaining hands-on technical experience, particularly those who had little to no job experience. Helping students understand the complexity and challenges of the enterprise resource planning (ERP) system selection and deployment life-cycle was also essential (Alharbi, 2021). A combination

of interactive laboratories, lectures, case studies, group projects, and system demos allowed for a thorough understanding of the suggested subjects. In order to provide students the necessary practical experience and show that even colleges with little funding can adopt such a strategy, the research concentrated on a freely available ERP system. In a one-semester graduate-level programme at the University of Jeddah in Jeddah, Saudi Arabia, the suggested framework was taught and assessed. Through the use of a survey, the course design was evaluated indirectly, and the findings demonstrated the beneficial influence of the suggested framework on students' learning objectives. The evaluation's findings confirm that open-source ERP systems used in experiential learning can enhance student learning outcomes.

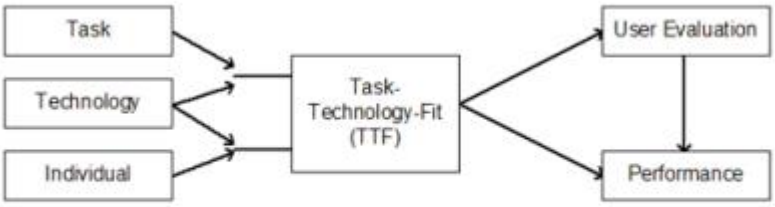
Universities were compelled by the COVID-19 epidemic to promote distant learning, which had an unprecedented effect on a large number of students. As a result of new lockdown and social distancing protocols implemented by universities, lecturer and student routines were instantly altered, and e-learning platforms replaced traditional classrooms. Nonetheless, lecturers frequently worry about students' disengagement from an e-learning platform while developing content for it (Pakinee, & Puritat, 2021). This study offers a gamification idea that is used to e-learning with the goal of increasing undergraduate students' participation in ERP courses, regardless of their personality types. The benefits and downsides of each game feature were used in order to undermine the overall achievement of the pupils in the development of the gamification design. Three assessments were carried out: an assessment to determine whether the student had proficiently acquired ERP knowledge; a web monitor to document student activity; and an interview-based qualitative analysis of the gaming experience. The

study finds that while choosing a gaming element according to personality factors may not always increase knowledge, it does increase student participation in the course.

ERPs, or enterprise resource planning systems, are the most vital and important information systems that are frequently used to integrate all company operations into a single, effective enterprise system. While the fundamentals of ERP systems are simple to comprehend, students, particularly those without technical background, often struggle to understand how various parts of these systems interact and support each other to increase business process effectiveness and efficiency. The research provides an example of the design of a MIS course that includes Microsoft Dynamics ERP (Zadeh, Zolbanin, Sengupta, & Schultz, 2020). According to the study, business students may gain technical skills during their learning process and recognise the value of technical expertise in today's marketplace by including technical parts of ERP systems into their ERP courses. To guarantee the maximum degree of expertise, the research concentrated on Microsoft Dynamics AXE as a unified ERP system along with its related technologies and products (i.e., SQL, Power BI, Visual Studio, etc.). There are offered examples of the course's description, practical labs, activities, and resources. Included are student evaluation results that substantiate the idea that practical instruction on the Microsoft Dynamics AXE ERP system may result in enhanced learning outcomes on both a functional and technical level.

If installed and used properly, enterprise resource planning systems may be a highly strong option for many both academic and non-academic institutions. If not, the system will halt a number of commercial operations. To investigate the interaction between the three main ERP modules—the student data module, the financial component, and the human resource

module—110 questionnaires were sent to important academic stakeholders. The study's findings suggest a connection between the academic achievement and the three modules (Shatat & Al Burtamani, 2019). Nevertheless, the human resources module at Sohar University has no effect on academic achievement; only the financial management and student information modules have a discernible influence on academic success. Although the use of one case study technique in this study may restrict the generalizability of the findings to other educational institutions, it does provide an opportunity for more researchers to conduct many case studies at different colleges in the area.



Source: Googhue (1995).

Fig. 2. The model of task-technology fit.

Source: DeLone and McLean (1992).

Fig. 3. D&M IS success model.

Study used both task technology fit model and D&M IS success model to assess the impact of ERP on academic performance while the current study objective looked into proposed design of ERP systems in academic provision.

Based on the research on CSFs and the functions of CBISs in business, a theoretical framework was put out. Six important CSFs are included in the model along with their relationships to the realisation of the critical functions that CBISs play. The most popular measuring items from the ERP literature were taken into consideration while creating a questionnaire to assess the suggested model. Data were gathered from 219 important parties. According to Adelelmoula (2018), this study is one of the limited empirical investigations that evaluates the impact of critical CSFs on the effective deployment of ERP. The results provide more light on the relationships between six important CSFs and the overall accomplishment of the critical responsibilities of the CBIS. This study is particularly interesting in that it focuses on how these CSFs affect the collective accomplishment of the critical tasks of the CBIS rather than the accomplishment of each duty separately. The study also looked at these consequences in the context of higher education, which has unique business procedures and services of its own.

Businesses aim to obtain a long-term competitive edge in a variety of dynamic markets. In order to take advantage of these conditions and modify business procedures, companies have had to match technological advances with business strategy. For firms to develop strong skills, boost operational performance, improve corporate decision making, and compete significant a global business environment, a system for enterprise resource planning has grown in significance. Stated differently, an ERP system incorporates business procedures and organisational modifications in addition to integrating an organization's resources (Soliman,

Karia, Moeinzadeh, Islam, & Mahmud, 2019). The widespread increase in IS investment has coincided with a sharp increase in ERP system deployment. ERP system use by Higher Education Organisations (HEIs) has begun recently. Egypt is one country that has taken this action to improve its competitiveness in the international market. One of the primary reasons customers oppose utilising the ERP system, meanwhile, is the high failure rate associated with ERP adoption in the past. On the other hand, the ERP system's deployment depends on users' acceptance of it. Even though the UTAUT model was used in several studies, researchers did not give as much thought to how to categorise concepts like technical, organisational, and individual context. However, there has been little study employing characteristics like compatibility and complexity, particularly in educational contexts.

2.3 Theoretical Review

The study was propelled by the following theories: systems theory; and resource-based theory. To estimate the probability of usability of the ERP System occurring based on dataset of independent variables, Logistic Regression (Logit) Model was employed.

2.3.1 Systems Theory

Bertalanffy's (2016) system theory was utilised in the investigation. Rather of breaking down a whole into its component components and examining each one's unique features, systems theory concentrates on the interactions between the parts and the characteristics as a whole (Ackoff, 2015 and Katz, 2016). Von Bertalanffy's original notion of a system was translated by Ackoff (2015) to the organisational context since he feels that the systems thinking approach is crucial to the investigation of organisations. At any given moment, a structure or

one of its parts presents a state, which is described as its pertinent attributes, values, or features. A system is made up of a minimum of two elements and the connection that exists between them. An event is a shift in a system's status. As Bertalanffy (2016) puts it, an event is more widely defined as an occurrence or anything that takes place.

A significant categorization of occurrences is known as behaviour. These are the things that set off other things. Claiming a lot of exclusions on your tax return, for instance, is a behaviour since it increases the likelihood of a tax audit, which is another event. A method is a series of actions that make up a system and are intended to achieve a certain outcome. The behaviour in each phase moves the structure closer to its objective, even when objectives aren't always realised and can come with other unforeseen consequences. The core of the system approach to analysis is observing and understanding processes across time and from this holistic point of view (Angell, 2015).

An ERP system that applies systems theory acknowledges that one of the essential knowledge processes is performed repeatedly. Events and actions might have a knock-on impact that modifies the conditions of other subsystems. The processes that reinforce one another may include actions that cause favourable or bad consequences to increase or decrease. ERP systems have the potential to produce really generative learning or reactive solutions. The four processes might be seen as shut down, open, or fluid structures depending on how they have been implemented. Each is somewhat impacted by how students who use the ERP systems perceive the systems' ability to offer services.

System theory, however, does not inform much on academic service delivery, and hence resource-based theory will address.

2.3.2 Resource Based Theory

Barney, Resource-Based Theory (2016). According to Barney (2016), the foundation of a firm's long-term competitive advantage is its capabilities, resources, and utilities. They are precious, uncommon, non-replaceable, and only partially imitable. According to Resource Based Theory, a company can create a lasting competitive advantage by producing complex social relationships that are ingrained in its history and culture, supporting the development of firm-specific competencies, and creating tacit organisational expertise (Odhong et al., 2013). According to this idea, the most important, non-replaceable, and somewhat immutable resource that a business may effectively employ to improve organisational productivity and competitiveness is its ERP systems (Barney, 2016).

According to the Resource Based Theory, a higher education institution's success is mostly determined by its resources, such as its ERP System, and they may provide the school an academic performance edge. Barney (2016) defines resources as all the assets, capacities, organisational procedures, firm features, ERP systems, information, and knowledge that a firm controls and that allow it to develop and put into practise strategies that increase its efficacy and efficiency (Barney, 2015).Based on the study, the theory will be helpful to the management of Masinde Muliro of Science and Technology University to know how the ERP system enhances academic service delivery in terms students' access the school information such as courses, fee statements, library resources, school announcements among others.

2.4 Logistic Regression Model.

Logistic regression is a powerful statistical technique used to model the probability of binary outcomes. In the context of academic service delivery in Enterprise Resource Planning (ERP) systems, logistic regression plays a pivotal role in understanding and optimizing the factors that influence the quality of service provided. This paper provides a detailed exploration of logistic regression and its practical application in ERP systems, focusing on a case study at Masinde Muliro University of Science and Technology. We will delve into the foundations of logistic regression, its relevance in analysing ERP systems, and present an in-depth analysis of the findings from our case study.

2.4.1 Foundations of Logistic Regression

Logistic regression is a valuable tool for modelling binary outcomes. When we deal with situations where the dependent variable is categorical and the relationships between independent variables and the outcome are not linear, logistic regression is the method of choice.

2.4.2 The Logistic Function

At the core of logistic regression is the logistic function, often referred to as the sigmoid curve. This function takes continuous input and maps it into an output between 0 and 1. This output represents the probability of a binary event occurring. In our context, the logistic function calculates the likelihood of 'high' or 'low' academic service delivery based on specific factors.

The logistic regression equation is as follows:

$$P(Y=1)=1/1+e-(\beta 0+\beta 1X1+\beta 2X2+...+\beta kXk)$$

Here, $P(Y=1)$ represents the probability of the event occurring, e is the base of the natural logarithm, and $\beta 0, \beta 1, \beta 2, ... \beta k$ are the coefficients estimated from the data. On the other hand. $X1, X2, ... Xk$ represent the independent variables. The logistic regression model provides insights into how changes in these independent variables influence the log-odds of the binary event.

2.4.3 Assumptions of Logistic Regression:

Independence of Observations: The foundational tenet of logistic regression is the independence of observations from one another. In other words, the results of one investigation do not influence the results of another. An assumption broken may result in skewed parameter estimations.

Logit linearity: Although the logistic regression method does not require a linear connection between independent factors and the dependent variable's log-odds, it does presuppose linearity in the logit, or the odds' natural logarithm. This suggests that an independent variable has a consistent impact on the log-odds for all values of the variable.

Lack of Multicollinearity: The premise of logistic regression is that the independent variables do not interact with one another. When independent variables exhibit strong correlation, it becomes challenging to discern each one's unique impact on the dependent variable, a phenomenon known as multicollinearity.

Large Sample Size: Logistic regression performs better with larger sample sizes, which ensures stable parameter estimates and reliable statistical tests. Small sample sizes can lead to unstable estimates and unreliable inferences.

Binary or Ordinal Dependent Variable: Logistic regression is designed for binary or ordinal dependent variables. For nominal categorical outcomes, multinomial logistic regression or other techniques are more appropriate.

2.4.4 Interpretation of Logistic Regression Coefficients:

Because logistic regression coefficients indicate the change in the dependent variable's log-odds for a change of one unit in the independent variable, interpreting them can be difficult. On the other hand, odds ratios may be obtained by taking the antilog of the coefficients and exponentiating them. A higher odds ratio than one signifies a higher probability of the event happening, whereas a lower odds ratio than one implies a lower probability.

2.4.5 Challenges in Logistic Regression:

Overfitting: Just like in linear regression, logistic regression models can suffer from overfitting if there are too many predictors relative to the number of observations. Regularization techniques such as L1 and L2 regularization can help mitigate this issue.

Perfect Separation: Logistic regression may encounter problems when there is perfect separation in the data, leading to infinite parameter estimates. This can occur when an independent variable perfectly predicts the outcome, and it requires careful handling.

Model Complexity: Choosing the right set of independent variables and their functional forms can be challenging. Poor model specification can lead to biased estimates and poor model fit.

Sample Size: Logistic regression may not perform well with small sample sizes, as it may lead to unreliable parameter estimates and wide confidence intervals.

Assumption Violations: Violations of the assumptions can impact the reliability of the model. For example, if observations are not independent, the model may produce incorrect parameter estimates.

Understanding these aspects of logistic regression is essential for its effective application in ERP system analysis and other domains. Now, let's explore the broader applications of logistic regression in various fields, showcasing its versatility and significance in modern data analysis.

2.4.6 Applications of Logistic Regression in Various Fields:

Medical Research: Logistic regression is widely used in medical research to predict binary outcomes, such as the presence or absence of a disease based on various risk factors. It helps in identifying significant predictors and developing diagnostic models.

Marketing and Customer Analytics: In marketing, logistic regression is employed to predict customer behaviours, such as whether a customer will make a purchase or churn. It aids in customer segmentation and targeting.

Credit Scoring: Credit scoring models use logistic regression

2.4.7 Logistic Regression in ERP System Analysis

Logistic regression is particularly valuable in analysing ERP systems and their impact on academic service delivery. Several aspects make logistic regression an ideal choice for this purpose:

Binary Outcomes

Academic service delivery is often assessed in binary terms, such as 'high' or 'low' quality service. Logistic regression is well-suited for modelling such binary outcomes, providing a clear understanding of the factors influencing this categorization.

2.4.8 Identification of Significant Factors

Logistic regression excels at identifying the significant factors or ERP constructs that have a meaningful impact on academic service delivery. By examining the coefficients of independent variables, we can not only understand the direction but also the strength of these relationships. This allows us to pinpoint which factors play a crucial role in shaping the outcome.

Relationship Exploration

ERP systems are complex environments where various factors interplay. Logistic regression enables us to explore these intricate relationships. It helps us understand how different ERP constructs interact with each other to collectively influence academic service delivery. This holistic perspective is invaluable in optimizing ERP systems.

Predictive Modelling

Beyond understanding the relationships, logistic regression can be used for predictive modelling. It enables us to forecast the probability of achieving a specific level of academic service delivery based on the ERP constructs under investigation. This predictive capability empowers institutions to make data-driven decisions for improvement.

2.4.9 Case Study: Logistic Regression in Masinde Muliro University

Data Collection

To illustrate the application of logistic regression in ERP system analysis, we conducted a case study at Masinde Muliro University of Science and Technology. The data collected included information on various ERP constructs, such as system navigation, system presentation, system security, and user knowledge. Additionally, the quality of academic service delivery was assessed and categorized as either 'high' or 'low' based on predefined criteria.

Data Analysis

In the case study, a logistic regression model was applied to the collected data to investigate the relationship between the ERP constructs and academic service delivery. The logistic regression model generated coefficients for each ERP construct, revealing how each factor influenced the likelihood of 'high' academic service delivery.

2.5 Knowledge Gap

Reviewing of the literature showed that although it has been acknowledged by the researchers that there is limited knowledge on the poor usability of ERP systems, few research efforts have been directed towards the specific issues of usability. Several scholars have pointed out the lack of attention directed to ERP system usability while knowing it can reduce the costs of training and user support. As per research reviewed in this study (Amuhayalravo and Sakataka 2016; Murithi, 2013), it is clear that ERP usability issues results in long learning time, error rates, and user dissatisfaction. One study tried to explore usability and it was highly criticized. The ERP end-user tests of 13 companies in Taiwan only categorized the system into

complicated and difficult to use usability categories. There is a need to look at the factors such as effectiveness, efficiency, learnability, and security.

Based on this realisation, the study looked at how enterprise resource planning systems affected Masinde Muliro of Science and Technology University's academic service delivery in an effort to close this knowledge gap.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The chapter presents the area of study and the research design, techniques, and tools used to achieve the research objectives.

3.2 Study Area

Masinde Muliro University of Science and Technology in Kenya was the study's location. The university is situated in Kenya's Kakamega County. Kenyatta University, Jomo Kenyatta University of Agriculture Technology, Moi University, University of Nairobi and Egerton University, along with Maseno University are the other universities that have created extremely thorough and well-written strategic plans for the ERP implementation, which is why the university was selected (King, 2012). However, according to Makokha, Musiega and Juma (2013) despite, integration of the ERP system being successful in most of the departments in MMUST, based on the complexity, its performance in the students' affairs department was questionable.

3.3 Research Design

The design of the case study was descriptive. Kevin (2016) asserts that a case study focuses more on a thorough contextual investigation of a smaller number of circumstances or occurrences and how they relate to one another. This approach works well since the study has to accurately examine how the enterprise resource planning software affects academic service delivery at Science and Technology University's Masinde Muliro.

3.4 Target Population

Students, technical staff, and department leaders made up the study population. There are 5179 students at Masinde Muliro University of Science and Technology ranging from first to fifth year. 5226 respondents, or 10 department heads, 37 technical staff members, and 5179 students, were the target population (Masinde Muliro University of Science and Technology Report, 2017).

Table 3. 1 Target Population

Category	Target Population
Heads of department	10
Technical personnel	37
Students	5179
Total	5226

Source: (Masinde Muliro University of Science and Technology Report, 2017)

3.4 Sample and Sampling Technique

3.4.1 Sample

A sample, as described by Orodho and Kombo (2002), is a smaller group or subgroup drawn from the population that is easily available. The Krejcie & Morgan table (1970) was used to calculate the sample size of pupils. 408 responders made up the study's sample size.

Table 3. 2 Sample Size

Category	Target Population	Sample Size
Heads of department	10	10
Technical personnel	37	37
Students	5179	361
Total	**5226**	**408**

Source: (Author, 2018).

3.4.2 Sampling Technique

408 respondents were chosen using a stratified random sample approach and purposeful selection. Respondents who supplied information to meet the study's goals are included in the judgmental sampling approach (Kumar, 2011). A total of 37 technical people and 10 department heads were chosen using the purposive sample approach. The process of choosing the required number of samples from the sampling population while giving each element an equal and independent probability of selection using any method intended to choose a random sample is referred to as the "simple random sampling technique" by Kumar (2011). A stratified random sampling technique was used to select 361 students.

3.5 Instruments of Data Collection

The study used questionnaires as the main tool to collect the data.

3.5.1 Questionnaires

Students, department heads, and technical staff were given closed- and open-ended questionnaires created by the researcher. In addition to being effective and cost-effective, questionnaires enable the collection of information from a far bigger sample. The questionnaire was divided into five sections: user knowledge in Section E, security in Section D, system presentation in Section C, system navigation in Section B, and demographic data in Section A.

3.6 Data Collection Procedures

The researcher received an authorization letter after being cleared by university officials following the successful defence of the study project. The National Commission for Science, Technology, and Innovation (NACOSTI) research permission application was submitted by the researcher using the authorization letter. After obtaining the study's permit, the researcher went to MMUST to request authorization to gather data. In addition, the investigator employed a pair of study assistants to assist in distributing the surveys.

3.7 Validity and Reliability of Research Instrument

3.7.1 Validity of Research Instrument

Validity, as stated by Kabiru and Njenga (2009), indicates how well an instrument measures the things that it was designed to measure. Therefore, the validity construct as well as its content were used. By presentation of the instruments to the supervisors and consultation of the ICT experts, content validity of the instruments was achieved.

3.7.2 Reliability of Research Instrument

A research instrument's consistency and stability are measured by its reliability (Moser and Kalton, 2016). The test-reset approach was used to gauge the study's dependability. Using the test-retest procedure, the same instrument is given to the same participants twice (Gregory, 2012). By Pearson For every questionnaire, the Product Moment Correlation Coefficient (r) was computed. Acceptable dependability coefficients in the social sciences start at 0.6 (Nunnally and Bernstain, 2014; Gall and Borg, 2016). As a result, a correlation coefficient (r) value of 0.70 and above is considered appropriate.

3.7.2 Pilot Study

The purpose of a pilot research was to identify and address any potential questionnaire design flaws. This is the primary reason for doing this before completing the main survey (Malhotra, 2004; Cavana, Delahaye & Sekeran, 2001). Following finalisation of the study instrument, a group of forty-four (44) participants at the University of Eldoret were used for testing. They were chosen with similar qualities to those of the research population even though they were not part of it. Before to beginning the actual data gathering procedure, the research was conducted, which helped to improve the questionnaire's items. The results section analyses the pilot study's findings.

3.8 Data Analysis Procedure

Generating deductions and inferences from data obtained through an experiment or survey is known as data analysis (Kombo and Tromp, 2006). Qualitative as well as quantitative analysis were used in the investigation. Coding replies into categorical variables is a step in the

quantitative analysis process (Mbwesa, 2006). The quantitative study used both descriptive and inferential statistics. Then, rates and proportions will be utilised as the proper statistical procedures for the descriptive data, and multiple regression was applied for the inferential statistics. Furthermore, according to Maalim (1999), qualitative investigation is a methodical, subjective technique that is used to characterise and interpret human events.

The regression model was as follows:

$$y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ Equation 3.1}$$

Where y was academic service delivery, dependent variable x was enterprise resource planning, and β was the standardized regression coefficient.

X_1 represents system navigation

X_2 represents system security

X_3 represents system presentation

X_4 represents system ERP system learnability

ε error term

3.9 Ethical Consideration

The researcher exercised extreme caution to guarantee adherence to relevant legal regulations. For example, asking respondents for their informed consent and urging them to take part in the study willingly. Human dignity was being properly maintained. All respondents were prohibited from writing their identities anywhere on the questionnaire to ensure accuracy of the data they provided. In each of the offices the researcher visited for study, a letter of approval for introduction purposes was acquired from the university.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The study's conclusions and outcomes are presented in this section. This aligns with the goals and theories of the research. The response rate is simply reported at the beginning of the chapter. This was done to determine whether the data was trustworthy and sufficient for analysis. The results of the pilot research come before the response rate. the examination of the data to ascertain the instrument's validity and dependability throughout data collection. Descriptive data for the primary study were examined using percentages and displayed in tables. The findings of inferential statistics, including regression and correlation coefficients, which were utilised to test both association along with extent of variation in association, are also presented in this chapter.

4.2 Response Rate

Students and staff at Masinde Muliro University of Science and Technology received a total of 408 structured questionnaires. Out of the 408 questionnaires, 330 were finished and sent back. This suggested an 81% response rate. It is decided that the response rate is sufficient to infer research findings. According to Babbie (2002), a response at a rate of 50% or above is enough for evaluation, sixty percent or higher is regarded as acceptable, and seventy percent or higher is regarded as really good. As a result, the 81% response rate is excellent. Employing personal calls along with visits to remind respondents to complete and submit the

questionnaires helped to make this response rate a reality. In addition, the rate was raised by using study assistants that dropped and then collected up the completed surveys.

4.3 Pilot Study Results

Prior to distributing the main survey, the primary goal of a pilot study was to identify and address any potential errors in the questionnaire design (Cavana, Delahaye & Sekeran, 2001; Malhotra, 2004). Generally, this involved fine-tuning and revising the questionnaire to guarantee the validity and reliability of the measures and to make it more user-friendly (Flynn, et al., 1990).

Following the completion of the research instrument, forty-four (44) University of Eldoret respondents who were not part of the study population but had comparable characteristics were used as a sample to test the instrument. As a general guideline, the pilot test should comprise 10% of the sample (Kitsantas, Cheema & Ware, 2011). According to Drummond and Campling (2013), pre-test participants for a pilot sample should ideally reflect the makeup of the major survey and be as comparable as feasible to the finished group, including both normal and extreme responders.

Table 4. 1 Reliability of the instrument

Construct	No of items	Reliability (Cronbach alpha Coefficient)
System navigation	5	.868
System presentation	5	.712
ERP system learnability	5	.704
Security	5	.706
Service delivery	5	.702

4.3 Descriptive statistics for the respondent's characteristics

Respondents were asked to provide information regarding their demographic profile included; level of education, relationship with the university, period of service and year of study

4.3.1 Level of Education

For the staff majority of the respondents had secondary education and above thus could understand what was being sorted by the study. Respondents with a Secondary level of education were at 25%, college level at 29.16 % while university level of education was at 31.25%. For students, majority of them were year three of study in the university at 23.3% followed by year one at 21.67% , year four at 18.3%, year two at 17.3% and finally year five are the least at 17%.

Table 4. 2 Level of Education

Cases	Frequency	Percentage
Primary	7	2.05
Secondary	305	85.93
College	14	4.11
University	15	4.40
Total	**341**	**100**

4.3.2 Relationship with the University

From the findings, 14.07% were staff while 85.92% were the students these categories of respondents could adequately provide information in terms of academic service delivery.

Table 4. 3 Relationship with the University

Case	Frequency	Percentage %
Staff	48	14.07
Students	293	85.92
Total	**341**	**100**

4.3.3 Length of service with the university

The length of service of the staff was <5yrs 27.08%, respondents with 6-8yrs experience were 22.91%. 9-11yrs were also at 22.91% while over 12yrs were at 27.08%. From these findings, it can be concluded that 72.92% of the respondents had more than 5yrs experience hence could provide credible information in terms of ERP and academic service delivery.

Table 4. 4 Length of service with the university

Cases	Frequency	Percentage
<5yrs	13	27.08
6-8yrs	11	22.91
9-11yrs	11	22.91
Over 12yrs	13	27.08
Total	**38**	**100**

4.3.4 Year of study of the students

From the findings majority of students were at year three, the rest are evenly distributed hence could provide information required.

Table 4. 5 Year of study of the students

Case (Year of study)	Frequency	Percentage
1	65	22.18
2	52	17.75
3	70	23.89
4	55	18.77
5	51	17.41
Total	**293**	**100**

4.4 Descriptive statistics for the variables

The study used descriptive statistics such as frequencies and percentages and standard deviation to describe the basic features of the data in a study. They provide simple summaries of the sample and the measures forming the basis of virtually every quantitative analysis of data (Zikmund, Babin, Carr & Griffin, 2013).

4.4.1 Enterprise resource planning system navigation

In order to achieve goal one, the researcher set out to determine the degree of the system's enterprise resource planning navigation. Masinde Muliro University's current system navigation status was investigated using five answer items. Table 4.6 displays the results of the survey. Of the respondents, 45.5% agreed and very much agreed stated the ERP system is

easy to use and navigate (M=3.11 SD=1.38), while 36.6% disagreed and 17.9% were unsure. 41.7% of the respondents both agreed and strongly agreed that The ERP system rarely has errors or issues (M=3.10 SD=1.40) while 36.3% and 21.9% were in disagreement and undecided respectively. Besides, a majority of the respondents both agreed and strongly agreed (41.9%) The ERP system effectively organizes and presents information (M=3.09 SD=1.46), 39% disagreed while 19.1 % were undecided. Finally, 39.9% of respondents agreed (M=2.95 SD=1.42) that the ERP system can manage a lot of data, 39% disagreed and strongly disagreed, and 21.1% were unsure.

Table 4. 6 System navigation Descriptive Statistics

Responses	SD %	D%	UD%	A%	SA%	MEAN	SD
The ERP system is user-friendly and easy to navigate.	16.7	19.9	17.9	26.1	19.4	3.11	1.38
The ERP system rarely has errors or issues. -	17.6	18.7	21.9	19.1	22.6	3.10	1.40
The ERP system effectively organizes and presents information. -	18.8	20.2	19.1	17.0	24.9	3.09	1.46
The ERP system can handle a large amount of data effectively.	23.2	15.8	21.1	22.3	17.6	2.95	1.42

4.4.2 **Enterprise resource planning system presentation**

In order to achieve goal two, the business resource planning system's presentation level was one of the things the researcher attempted to ascertain. Five response questions were used to examine the present ERP flexibility level at Masinde Muliro University. Based on the data shown in Table 4.7, 36.6% of respondents concurred with and strongly concurred (M=2.95 SD=1.41) that the enterprise resource planning (ERP) system adjusts swiftly to changing situations, whereas 42.6% disagreed and 20.8% were unsure. 35.5% of respondents were of the opinion that the ERP system takes the needs of each individual user into account. (M=2.82, SD=1.42), whereas 44.6% and 19.9%, respectively, were unsure and in disagreement. Furthermore, 44% of respondents agreed or strongly agreed that the ERP system responds to user feedback (M=3.06 SD=1.45), compared to 39% who disagreed and 17% who were unsure. The enterprise resource planning (ERP) system is interoperable with other university systems, according to 38.4% of respondents. 39.9% disagreed along with strongly disagreed (M=3.0 SD=1.40), whilst 21.7% were unsure.

Table 4. 7 Flexibility Descriptive Statistics

Responses	SD %	D%	UD%	A%	SA%	MEAN	SD
The ERP system adapts quickly to changing conditions.	19.4	23.2	20.8	16.4	20.2	2.95	1.41
The ERP system considers individual user needs.	24.9	19.7	19.9	19.1	16.4	2.82	1.42
The ERP system is responsive to user feedback	20.2	18.8	17.0	22.3	21.7	3.06	1.45
The ERP system is compatible with other systems at the university.	18.8	21.1	21.7	18.2	20.2	3.00	1.40

4.4.3 Enterprise resource planning Security

In order to fulfil goal two, the researcher set out to determine the business intelligence (BI) security level. The security of the ERP at Masinde Muliro University was assessed using five answer items. The results show that 41% of respondents were of the opinion (M=3.04 SD=1.40) ensure the ERP system guarantees that private data is protected and available only by authorised users; 38.7% disagreed and 20.2% were unsure. The ERP system is dependable, according to 41.4% of respondents who agreed and strongly agreed on this point (M=3.00 SD=1.50), compared to 41.1% who disagreed and 17.6% who were unsure. Besides, a majority of the respondents both agreed and strongly agreed (41.1%) The ERP system is genuine and authentic (M=2.98 SD=1.43), 39.6% disagreed while 19.4% were undecided. Lastly, 42.8% of the respondents were in agreement that The ERP system can resolve disputes

effectively (M=3.09 SD=1.40), 37.8 % disagreed and strongly disagreed while 19.4% were undecided.

Table 4. 8 Security Descriptive Statistics

Responses	SD %	D%	UD%	A%	SA%	MEAN	SD
The ERP system ensures that personal information is secure and accessible only by authorized users.	18.8	19.9	20.2	21.1	19.9	3.04	1.40
The ERP system is reliable and dependable	24.1	17.0	17.6	17.6	23.8	3.00	1.50
The ERP system is genuine and authentic	22.3	17.3	19.4	21.7	19.4	2.98	1.43
The ERP system can resolve disputes effectively	17.6	20.2	19.4	21.1	21.7	3.09	1.40

4.4.4 Enterprise resource planning learnability

In order to fulfil goal four, the researcher set out to determine the learnability of the enterprise resource planning (ERP) system. The current state of ERP system accessibility at Masinde Muliro University was assessed using five answer items. The results shown in Table 4.9 show

that, while 38.7% disagreed along with 18.2% were unsure, 43.1% of respondents were of the opinion that students are comfortable with the ERP systems employed at the institution (M=3.10 SD=1.41). ERP systems aid students in successfully understanding information and data, according to 44% of respondents who were in full agreement with this statement. (M=3. 09 SD=1.41), whereas 19.7% and 36.4%, respectively, were unsure and disagreed. Besides, a majority of the respondents both agreed and strongly agreed (39.6%) that Students have sufficient knowledge to use the ERP system (M=2.97 SD=1.40), 41% disagreed while 19.4 % were undecided. Lastly ,39% of the respondents agreed that the university offers adequate training to help students become proficient in using the ERP system (M=2.97 SD=1.52), 42.5 % disagreed and strongly disagreed while 18.5% were undecided.

Table 4. 9 ERP system learnability Descriptive Statistics

Responses	SD %	D%	UD%	A%	SA%	MEAN	SD
Students are familiar with the ERP systems used at the university.	16.4	22.3	18.2	20.2	22.9	3.10	1.41
ERP systems help students understand information and data effectively.	18.8	17.6	19.7	23.2	20.8	3. 09	1.41
Students have sufficient knowledge to use the ERP system.	19.9	21.1	19.4	21.1	18.5	2.97	1.40
The university offers adequate training to help students become proficient in using the ERP system	24.3	18.2	18.5	14.1	24.9	2.97	1.52

4.4.5 Academic Service Delivery

The investigator aimed to determine the quality of academic service provision. Masinde Muliro University's current state of educational service delivery was investigated using five answer options. Namely; There is faster processing of customer requests, there is ease of access to information without going to the university, clients can easily give feedback on service delivery and finally if there is frequent unavailability of service due to network failure. Then the respondents were asked to rate academic service delivery based on the five criteria on a scale of 1 to 10. From the frequency distribution table 4.10 below we can depict that most of the respondents gave a score of 3 to 5 accounting for almost 56.31% of the response rate. 10.85% gave a score of more than 6 which is considered very high. Finally, 32.85% gave a low score on academic service delivery score at Masinde Muliro university

Table 4. 10 academic service delivery score

Cases	Frequency	Percentage
1	54	15.84
2	58	17.01
3	68	19.94
4	61	17.89
5	63	18.48
6	8	2.35
7	5	1.47
8	7	2.05
9	10	2.93
10	7	2.05
Total	**341**	**100**

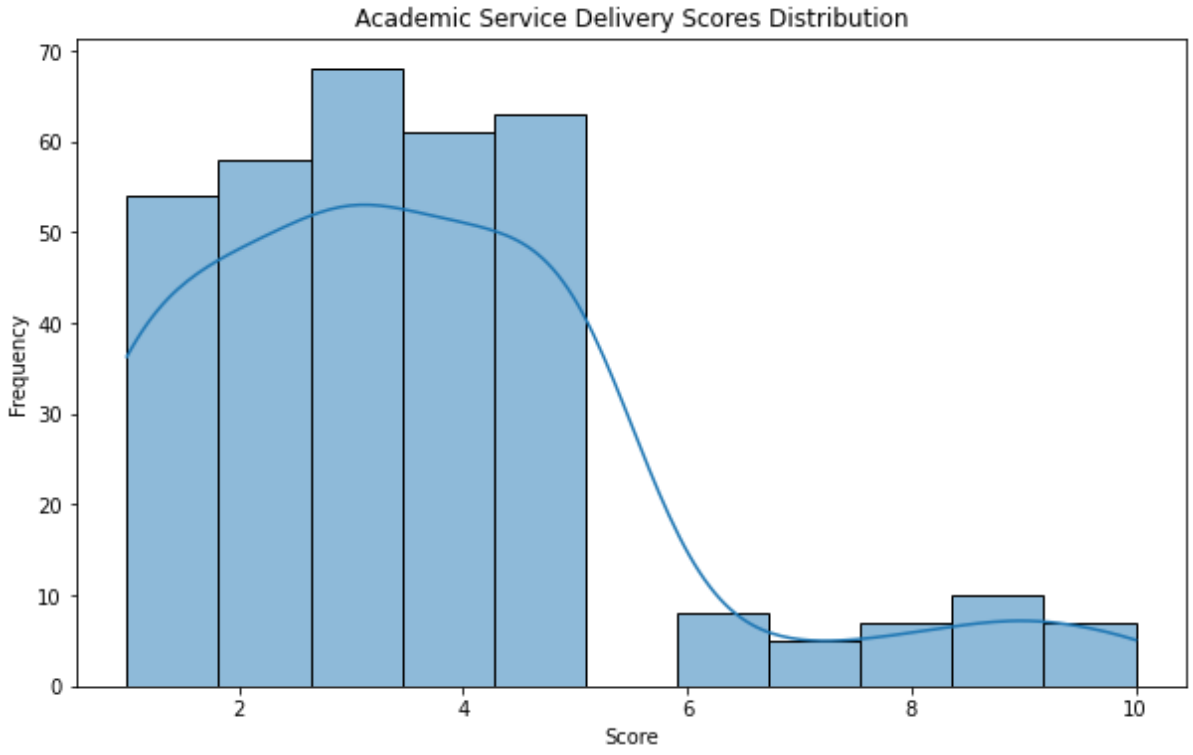
From table 4.11, The academic service delivery had a mean score of 3.61 and standard deviation of 2.09. the modal score was 3, minimum score 1 and maximum score at 10.

Table 4. 11 Academic Service Delivery Descriptive Statistics

Responses	max	count	mean	std	min	25%	mode	75%
Academic service delivery	10	341	3.61	2.09	1	2	3	5

The figure 4.12 below shows negatively skewed distribution for the academic score. Majorityof the responses score range between 1 and 4 while the minority scores are ranging from 6 to 10. 3 is the modal score for academic service delivery in Masinde Muliro university.

Figure 4.12 Frequency Distribution Histogram

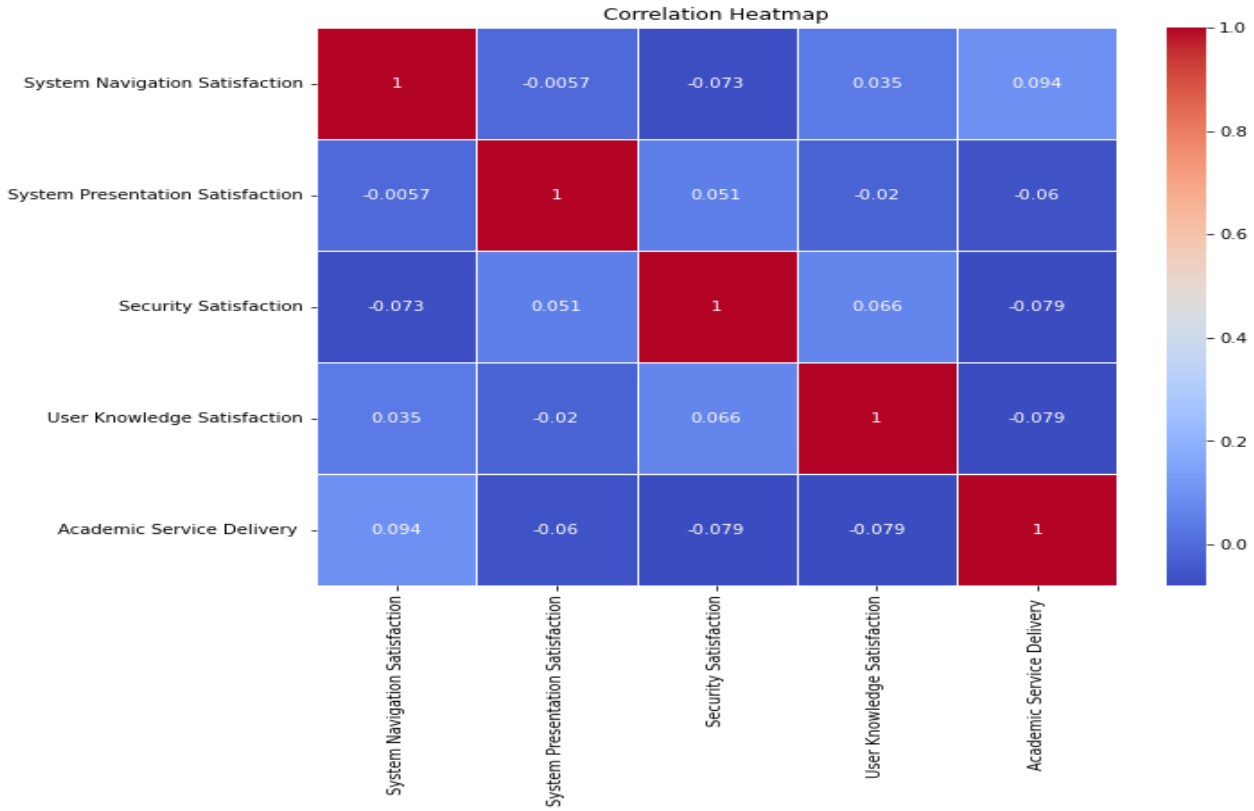


4.4 Requisite Tests.

4.4.1 Multicollinearity Test

Multicollinearity is a situation where the correlations among the independent variables are strong. Multiple logistic regression is applicable where there are no strong relationships among variables. Multicollinearity was tested using a correlation heatmap whereby for a value close to 1 is considered to be highly correlated with the corresponding variable and for a value close to 0 means there is little multicollinearity. The figure 4.13 below shows correlation matrix for our variables used in the model. There is little correlation between the variables and some have negative correlation as illustrated by the figure below.

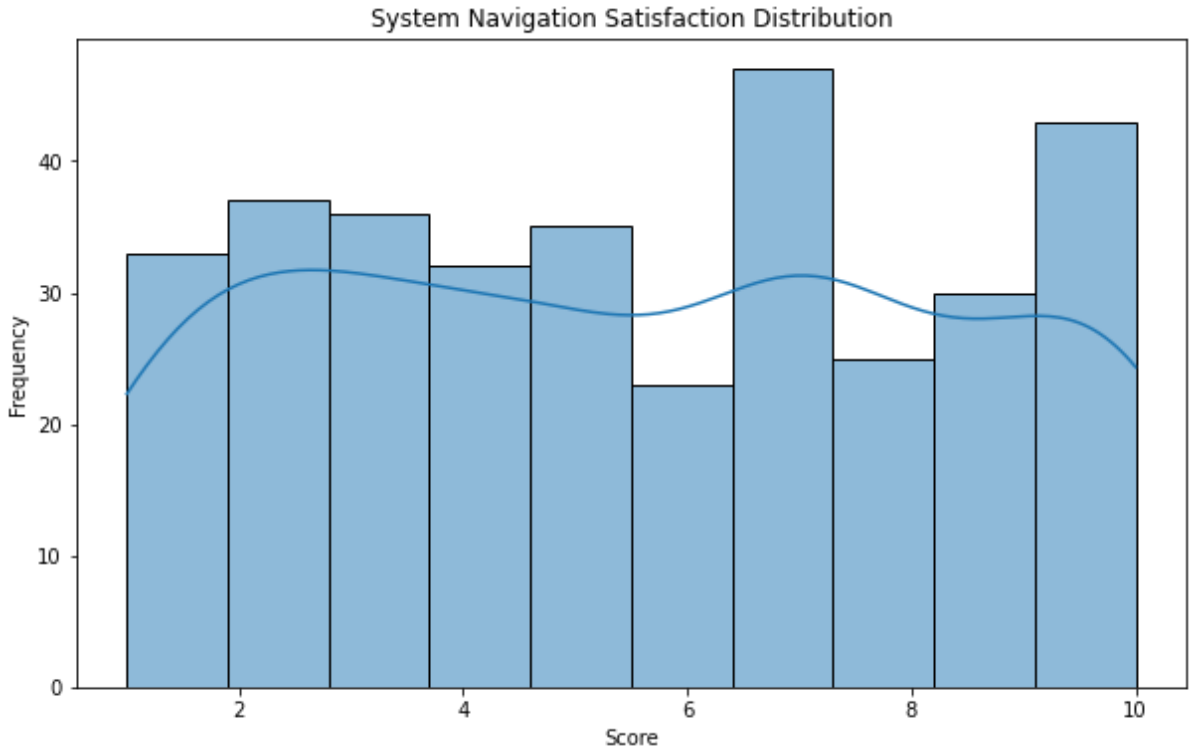
Figure 4.13 Correlation Heatmap



4.5 Logistic Regression Analysis

4.5.1 Effects of enterprise resource planning system navigation on academic service delivery

Figure 4.14: System Navigation Satisfaction Distribution



frequency distribution shown in figure 4.15 above for system navigation satisfaction distribution shows a fairly normal distribution curve for the scores ranging from 1 to 10. The modal score for system navigation metric is 7 while the minimum score is 8.

Table 4.12: System Navigation Satisfaction

Metric	Value
Precision	[1.0, 0.666]
Recall	[0.0, 1.0]
F1 Score	[0.0, 0.8]
ROC A. Score	0.506144

Confusion Matrix:

- True Positive (TP): 46
- False Negative (FN): 0
- True Negative (TN): 0
- False Positive (FP): 23

In this context:

- True Positives (TP) represent the cases where your model correctly predicted "High" academic service delivery when the system navigation satisfaction score was high.
- False Negatives (FN) are cases where the model failed to predict "High" academic service delivery when it was actually high.
- True Negatives (TN) are not relevant in this binary classification context.

- False Positives (FP) represent the cases where the model incorrectly predicted "High" academic service delivery when it was not.

Our model correctly identifies instances of "High" academic service delivery (TP = 46) but sometimes incorrectly predicts "High" service delivery when it's not (FP = 23) which is negligible.

Precision:

Precision for the 'positive' class is approximately 0.67.

Precision is the ability of the model to identify only the relevant instances among the predicted positive instances. In this context, our model is correct 67% of the time when it predicts high academic service.

Recall:

Recall for the 'positive' class is 1.0.

Recall (also known as sensitivity) is the ability of the model to find all the positive instances. In this case, the model correctly identifies all the actual positive cases.

F1 Score:

F1 Score for the 'positive' class is approximately 0.80.

The F1 Score is the balance between precision and recall. It's useful when you want to consider both false positives and false negatives. An F1 Score of 1 is perfect, and 0 is the worst. An F1 Score of 0.80 is quite good.

ROC AUC Score:

ROC AUC Score is approximately 0.51.

The ROC AUC (Receiver Operating Characteristic - Area Under the Curve) Score measures the ability of the model to distinguish between the two classes. An AUC score of 0.5 means the model's predictions are as good as random, and a higher score indicates better discrimination.

In conclusion, the model based on "System Navigation Satisfaction" performs well in terms of identifying "High" academic service delivery, as indicated by high recall. It rarely misses actual cases of "High" service delivery. However, the precision, which measures the accuracy of these predictions, is moderate (0.67). This means that the model sometimes incorrectly predicts "High" service delivery when it's not. Additionally, the ROC AUC score suggests that the model's ability to distinguish between "High" and "Low" academic service delivery based on "System Navigation Satisfaction" is not significantly better than random chance.

4.5.2 Effects of enterprise resource planning system presentation on academic service delivery

Figure 4.15: System navigation presentation

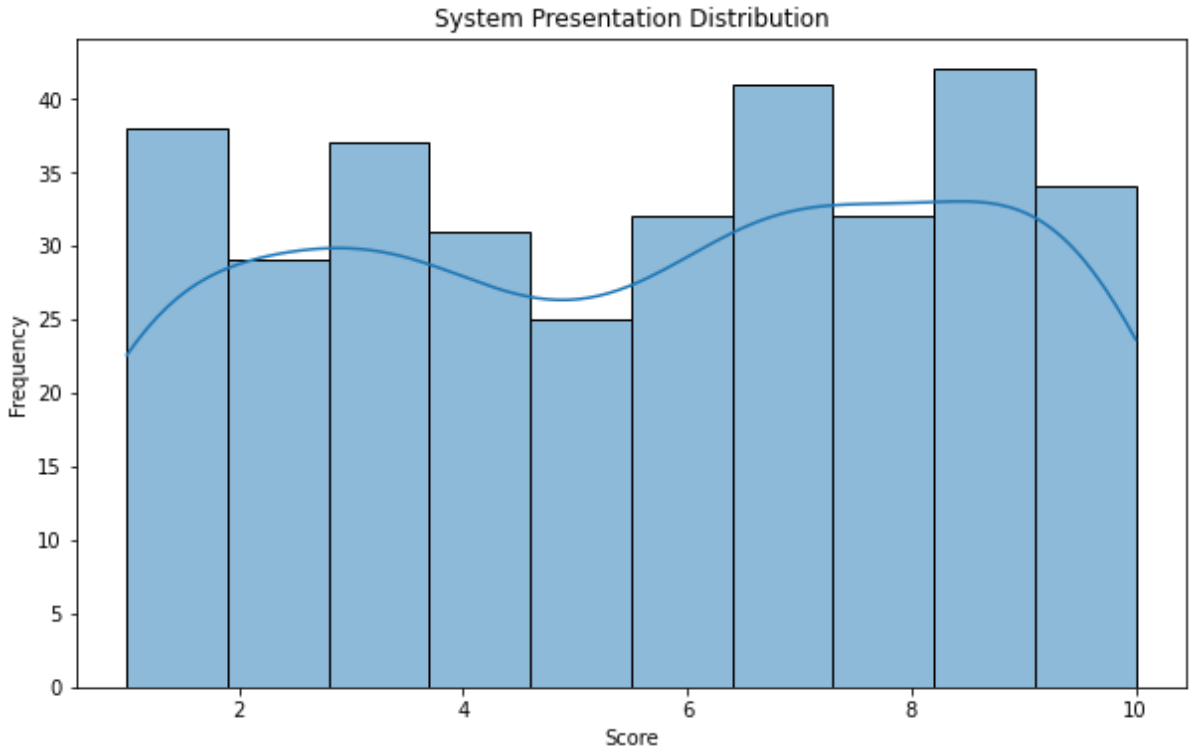


Figure 4.15 above shows System navigation presentation score distribution which is slightly positively skewed with majority of the score ranging from 6 to 10. Score 9 is the modal score for ERP system presentation. 5 is the least core on scale of 1to 10.

Table 4.13 system presentation score

Metric	Value
Precision	[1.0, 0.666]
Recall	[0.0, 1.0]
F1 Score	[0.0, 0.8]
ROC A. Score	0.431947

Confusion Matrix:

- True Positives (TP): 46
- True Negatives (TN): 0
- False Positives (FP): 0
- False Negatives (FN): 23

Our model correctly identifies instances of "High" academic service delivery (TP = 46) but sometimes incorrectly predicts "High" service delivery when it's not (FP = 23)

Precision:

Precision for "High" academic service delivery: 1.00 (100%).

Precision for "Low" academic service delivery: 0.67 (67%).

For "High" academic service delivery, the model's precision is perfect (1.00), meaning that when it predicts "High," it is always correct. For "Low" academic service delivery, the precision is 0.67, indicating that the model's predictions are accurate in 67% of the cases.

Recall (Sensitivity):

Recall for "High" academic service delivery: 1.00 (100%) and Recall for "Low" academic service delivery: 0.00 (0%). Recall, also known as sensitivity, measures the model's ability to identify all relevant instances. The recall for "High" academic service delivery is perfect (1.00), indicating that the model correctly identifies all actual "High" cases.

F1 Score:

F1 Score for "High" academic service delivery: 1.00 (100%) and F1 Score for "Low" academic service delivery: 0.80 (80%). The F1 Score is the harmonic mean of precision and recall. The F1 Score for "High" academic service delivery is perfect (1.00), indicating a balance between precision and recall. For "Low" academic service delivery, the F1 Score is 0.80, which also suggests a good balance between precision and recall.

Interpretation: Support represents the number of samples in each class.

ROC AUC Score:

ROC AUC Score: 0.43. The ROC AUC score measures the model's ability to distinguish between the two classes. A score of 0.43 suggests that the model's ability to differentiate between "High" and "Low" academic service delivery based on "System Presentation Satisfaction" is not significantly better than random guessing.

In summary, the model based on "System Presentation Satisfaction" performs exceptionally well in identifying "High" academic service delivery, as indicated by high precision, recall, and F1 Score. It rarely misses actual cases of "High" service delivery. However, the model fails to predict any cases of "Low" academic service delivery, resulting in a recall of 0 for the "Low" class. The ROC AUC score suggests that the model's ability to distinguish between the two classes is not significantly better than random chance. This indicates that the model is excellent at identifying positive cases (High academic service delivery) but needs improvement in identifying negative cases (Low academic service delivery).

4.5.3 Effects of enterprise resource planning system security on academic service delivery

The distribution of the System Security Satisfaction scores exhibits a characteristic bell-shaped curve, indicative of a relatively normal distribution, as depicted in Figure 4.16. The majority of scores fall within the range of 3 to 7, with a notable peak at a score of 5, signifying the mode of the satisfaction ratings for the ERP system security at Masinde Muliro. Conversely, the score of 8 represents the least common rating for system security.

Figure 4.16: System Navigation Satisfaction Distribution

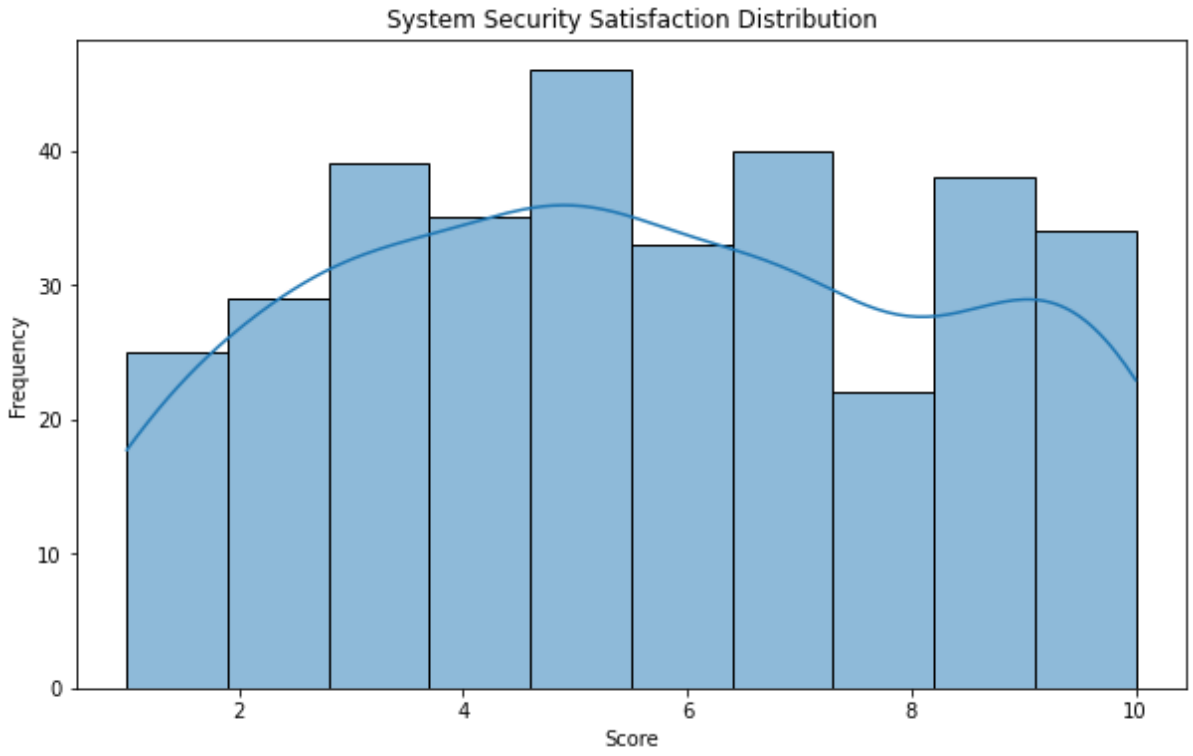


Table 4.14 system security score

Metric	Value
Precision	[1.0, 0.666]
Recall	[0.0, 1.0]
F1 Score	[0.0, 0.8]
ROC A. Score	0.5708884

1. Confusion Matrix:

The confusion matrix is a tabular representation of the model's performance:

- True Negatives (TN): 0
- False Positives (FP): 23
- False Negatives (FN): 0
- True Positives (TP): 46

True Negatives (TN): These are instances where the model correctly predicted "Low" (0) Academic Service Delivery when the actual outcome was also "Low."

False Positives (FP): These are instances where the model incorrectly predicted "High" (1) Academic Service Delivery when the actual outcome was "Low." There are 23 such cases.

False Negatives (FN): There are no instances where the model incorrectly predicted "Low" when the actual outcome was "High."

True Positives (TP): These are instances where the model correctly predicted "High" Academic Service Delivery when the actual outcome was also "High."

Precision: Precision measures the accuracy of the model's positive predictions, indicating how many of its "High" predictions were accurate. Precision for "High" (1) class: 1.0 - This means that when the model predicts "High," it is accurate every time. Precision for "Low" (0) class: 0.6667 - The model's accuracy for predicting "Low" is not perfect; it makes some incorrect predictions.

Recall: Recall calculates the ability of the model to identify all relevant instances of the "High" class. Recall for "High" (1) class: 1.0 - This means the model correctly identifies all "High" instances. Recall for "Low" (0) class: 0.0 - The model fails to identify any "Low" instances.

F1 Score: F1 Score is the harmonic mean of precision and recall, providing a balance between precision and recall. F1 Score for "High" (1) class: 0.8 - The model achieves a good balance of precision and recall for the "High" class.

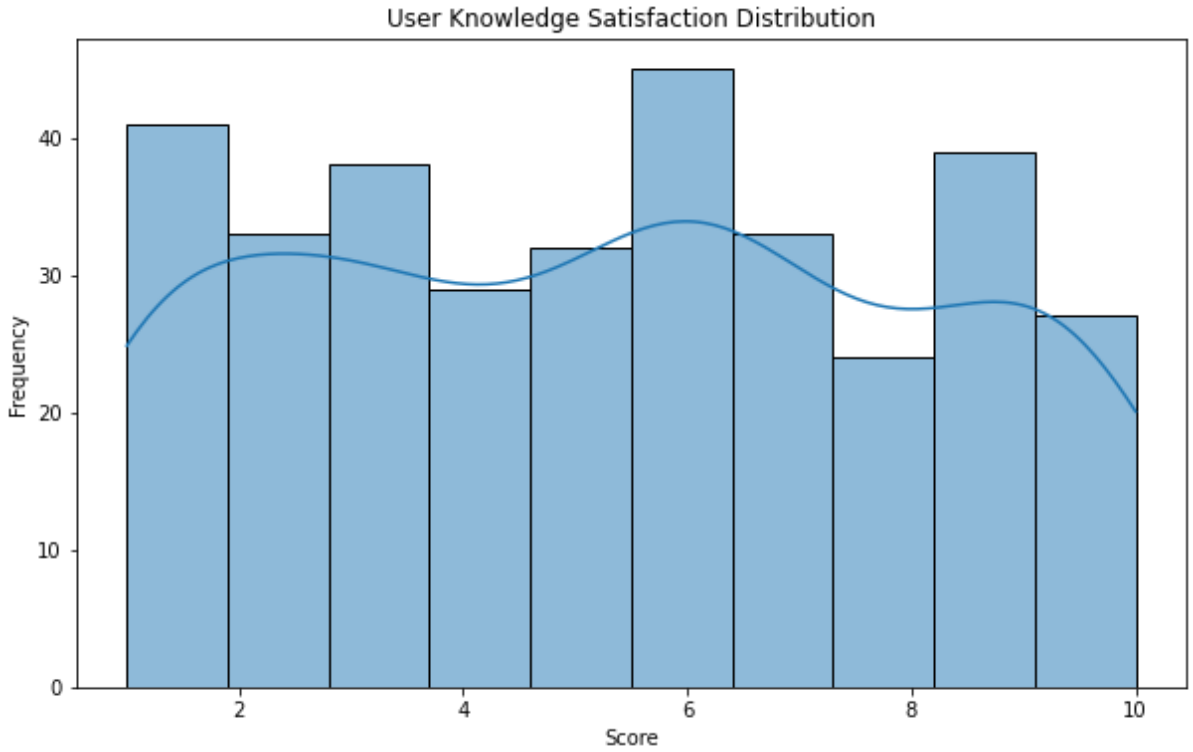
ROC AUC Score (Receiver Operating Characteristic Area Under the Curve):

The ROC AUC Score quantifies the model's ability to distinguish between the two classes. In this case, the ROC AUC Score is 0.5709. This score is greater than 0.5, indicating that the model has some ability to differentiate between the two classes. However, it's not a perfect score, and there is room for improvement.

In conclusion, when using system security as independent variable the model performs very well in predicting the "High academic service delivery" class, achieving perfect precision and recall. This means that when it predicts "High," it is always accurate. However, while the model excels in predicting the "High" class, it needs significant improvement in predicting the "Low" class.

4.5.4 Effects of enterprise resource planning system user knowledge on academic service delivery.

Figure 4.17: User Knowledge Satisfaction Distribution



The distribution of user knowledge scores in the ERP system reveals a relatively normal curve, as illustrated in Figure 4.17. It is noteworthy that the modal score for user knowledge is recorded at 6, while the least prevalent score stands at 8. The majority of respondents have assigned scores ranging from 1 to 6, encompassing the central part of the distribution.

Table 4.15 system user knowledge score

Metric	Value
Precision	[1.0, 0.666]
Recall	[0.0, 1.0]
F1 Score	[0.0, 0.8]
ROC A. Score	0.6375

Confusion Matrix:

The confusion matrix is a tabular representation of the model's performance:

- True Negatives (TN): 0
- False Positives (FP): 23
- False Negatives (FN): 0
- True Positives (TP): 46

True Positives (TP) **-** These are instances where the model correctly predicted "High" Academic Service Delivery when it was indeed "High."

True Negatives (TN)- These are instances where the model correctly predicted "Low" Academic Service Delivery when it was indeed "Low."

False Positives (FP)- These are instances where the model incorrectly predicted "High" Academic Service Delivery when it was actually "Low."

False Negatives (FN) - These are instances where the model incorrectly predicted "Low" Academic Service Delivery when it was actually "High."

Precision: Precision for "Low" (0.6667) means that when the model predicts "Low" Academic Service Delivery, it is correct about 66.67% of the time. Precision for "High" (1.0) means that when the model predicts "High" Academic Service Delivery, it is correct 100% of the time.

Recall: Recall (or Sensitivity) measures the model's ability to identify all relevant instances. Recall for "Low" (0.0) means that the model is unable to correctly identify "Low" Academic Service Delivery instances. This suggests that it might be overly biased towards predicting "High.". Recall for "High" (1.0) means that the model is excellent at identifying "High" Academic Service Delivery instances. It captures all of them.

F1 Score: The F1 Score is the harmonic mean of precision and recall and provides a balance between the two. F1 Score for "High" (0.8) indicates a good performance in predicting "High" Academic Service Delivery.

ROC AUC Score: The ROC AUC (Receiver Operating Characteristic Area Under the Curve) Score is a measure of the model's ability to distinguish between the two classes. An ROC AUC Score of 0.6375 suggests that the model has a relatively good ability to discriminate between "Low" and "High" Academic Service Delivery.

In summary, this output indicates that the model is performing well in predicting "High" Academic Service Delivery with user knowledge variables with high precision, recall, and F1 Score. However, it performs poorly in predicting "Low" Academic Service Delivery, as

evidenced by low precision, recall, and F1 Score for that class. The ROC AUC Score suggests that the model has decent discriminatory power.

4.5.5 Effect of enterprise resource planning systems on academic service delivery

Multiple logistic regression analysis was used to test the formulated hypotheses. Using all the four features namely system presentation, system navigation, security and system user knowledge in prediction of academic service delivery.

Table 4.16 Variable Coefficients

Variable	Log Odds
System Navigation	**-0.0889**
System presentation	**0.11689**
Security	**0.04505**
User Learnability	**0.05924**

Figure 4.18: Features in Logistics Regression Model

These coefficients represent the log odds for each independent variable. Log odds describe the change in the log-odds of the dependent variable (in this case, academic service delivery) for a one-unit change in the corresponding independent variable.

System Navigation Satisfaction has a negative coefficient, indicating that an increase in System Navigation Satisfaction is associated with a decrease in the log-odds of high academic service delivery.

System Presentation Satisfaction has a positive coefficient, indicating that an increase in System Presentation Satisfaction is associated with an increase in the log-odds of high academic service delivery.

Security Satisfaction has a positive coefficient, suggesting that an increase in Security Satisfaction is associated with an increase in the log-odds of high academic service delivery.

User Knowledge Satisfaction also has a positive coefficient, implying that an increase in User Knowledge Satisfaction is associated with an increase in the log-odds of high academic service delivery.

Table 4.17 system user knowledge score

Metric	Value
Precision	[1, 0.6865]
Recall	[.0869, 1.]
F1 Score	[.16, 0.81]
ROC A. Score	0.4839

Model Accuracy:

The model's overall accuracy is 0.70 (or 70%). This means that the model correctly predicts academic service delivery (High or Low) for 70% of the cases in the test dataset.

Confusion Matrix:

- True Positives (TP): 46
- True Negatives (TN): 2
- False Positives (FP): 21
- False Negatives (FN): 0

The model correctly predicted 46 instances of "Low" academic service delivery (True Positives). It correctly predicted 2 instances of "High" academic service delivery (True Negatives). It made 21 incorrect predictions of "Low" when the actual class was "High" (False Positives). It did not make any incorrect predictions of "High" when the actual class was "Low" (False Negatives).

Precision: Precision for "High" (1.0): Precision measures the accuracy of positive predictions. A precision of 1.0 means that when the model predicts "High," it is always correct. Precision for "Low" (0.6866): When the model predicts "Low," it is correct approximately 68.66% of the time.

Recall (Sensitivity): Recall for "High" (0.08695652): Recall measures the ability of the model to correctly identify true positive cases. In this case, the model has a recall of 8.70% for "High,"

which means it struggles to identify "High" cases. Recall for "Low" (1.0): The model has perfect recall for "Low," meaning it correctly identifies all "Low" cases.

F1 Score: F1 Score for "High" (0.16): The F1 score is the harmonic mean of precision and recall. A low F1 score for "High" indicates a trade-off between precision and recall, which means the model is having difficulty achieving both high precision and high recall for "High" cases. F1 Score for "Low" (0.8142): The F1 score for "Low" is relatively high, indicating a good balance between precision and recall for "Low" cases.

ROC AUC Score (0.4839): The Receiver Operating Characteristic Area Under the Curve (ROC AUC) measures the ability of the model to distinguish between the two classes (in this case, "High" and "Low"). An ROC AUC of 0.4839 suggests that the model's ability to distinguish between the classes is limited, as it is close to random guessing (ROC AUC of 0.5).

In summary, the model is performing well in terms of precision for "High," as it is always correct when predicting "High." However, it struggles with recall and F1 score for "High," indicating a difficulty in correctly identifying "High" cases. For "Low," the model has a good balance between precision and recall, resulting in a high F1 score. The ROC AUC score suggests that the model's ability to distinguish between the two classes is not very strong, and there is room for improvement, particularly in predicting "High" academic service delivery.

Model improvement:

Metric	Value
Precision	[1.0, 0.666]
Recall	[0.0, 1.0]
F1 Score	[0.0, 0.8]
ROC A. Score	0.525519

Grid Search CV method was used for hyperparameter tuning of The Logistic Regression model. This technique is used to find the best set of hyperparameters for a model, which can lead to improved model performance. The purpose of this process is to find hyperparameters that maximize the model's performance on specific dataset. By searching over a predefined grid of hyperparameters, with an aim of improving the model's accuracy, precision, recall, or other performance metrics, depending on the problem being solved. The fine-tuned model demonstrates a small improvement in its ability to distinguish between positive and negative instances which is indicated by the ROC AUC score (0.5255) while maintaining the same levels of precision, recall, and F1 score. The consistency in key metrics indicates that the fine-tuning process did not significantly alter the model's performance but made slight enhancements.

In the context of academic service delivery at Masinde Muliro University, System Navigation Satisfaction seems to negatively impact high academic service delivery, but the model's precision for "High" is perfect. System Presentation Satisfaction has a positive impact on high academic service delivery, but the model's recall for "High" is very low. Security Satisfaction

and User Knowledge Satisfaction also have a positive impact on high academic service delivery, but the model's precision for "Low" is 69%, indicating some false positives.

The model is better at identifying "Low" academic service delivery cases and could be improved in terms of identifying "High" academic service delivery cases. Interpretation should be made cautiously based on the domain knowledge and the specific context of the data and university. Further evaluation and adjustments may be needed for a more reliable model.

4.6 Discussion of Results

The primary objective of this study was to investigate the influence of system usability, specifically System Navigation Satisfaction, System Presentation Satisfaction, Security Satisfaction, and User Knowledge Satisfaction, on academic service delivery at Masinde Muliro University of Science and Technology. The study aimed to examine the extent to which these usability factors impact academic service delivery. The following discussion provides insights into the findings based on the model results. System Navigation Satisfaction (-0.0889) System Navigation Satisfaction reflects the ease and efficiency with which users navigate the Enterprise Resource Planning (ERP) system. The negative coefficient suggests that as System Navigation Satisfaction decreases, academic service delivery is also negatively affected. The model results indicate a degree of importance, though not overwhelmingly high, with an associated coefficient of -0.0889. System Presentation Satisfaction (0.1169) pertains to the visual and interactive aspects of the ERP system. A positive coefficient of 0.1169 suggests a positive impact on academic service delivery. Improved System Presentation Satisfaction contributes positively to academic service delivery, albeit with a moderate degree of importance. Security Satisfaction (0.0451) Security Satisfaction focuses on the confidentiality

and privacy of data within the ERP system, as well as the credibility of interactions with other applications. The positive coefficient of 0.0451 signifies that enhanced Security Satisfaction has a favourable effect on academic service delivery, though it exhibits a relatively lower importance level. User Knowledge Satisfaction (0.0592) User Knowledge Satisfaction indicates the degree to which users understand and are proficient in using the ERP system. A positive coefficient of 0.0592 demonstrates a positive correlation with academic service delivery. While this factor contributes to academic service delivery, its importance is moderate.

The accuracy of the model, which represents the proportion of correctly predicted instances, is approximately 69.57%. meaning that it correctly predicted the academic service delivery status for this dataset in nearly 70% of cases. The study's findings underscore the significance of usability factors, particularly system presentation satisfaction and security satisfaction, in shaping academic service delivery. As these factors improve, academic service delivery is likely to benefit. System navigation satisfaction, while displaying a negative coefficient, remains a noteworthy variable. It emphasizes the importance of efficient system navigation to avoid potential decreases in academic service delivery. The results indicate that system security and user knowledge are positively associated with academic service delivery. Security measures should be maintained to protect data confidentiality, and user knowledge and training should be promoted to enhance system proficiency.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

The research that looked at how the enterprise resource planning system at Masinde Muliro University of Science and Technology affected academic service delivery is summarised in this chapter. Research topics and precise objectives served as the study's compass. As a result, this chapter provides an overview of the research project, study results, suggestions, and future research directions related to data analysis.

5.2 Summary

This study's primary goal was to investigate how Masinde Muliro University of Science and Technology's academic service delivery is impacted by enterprise resource planning systems. The study examined how Masinde Muliro University of Science and Technology's academic service delivery was impacted by system navigation, system security, system display, and ERP system learnability. The results of this study demonstrated that enterprise resource planning has a major impact on Masinde Muliro University of Science and Technology's academic service delivery. The study assessed how well the MMUST academic service delivery system for enterprise resource planning worked. An academic has to be always searching for methods to make their institution better. In this research, the researcher was specifically interested in the use of enterprise resource planning systems within the university environment. In particular, the researcher explores whether these systems can be utilized to enhance service delivery and increase productivity for faculty, staff, and students alike. In the context of this

study, service delivery refers to the level of support that system users receive when accomplishing different tasks on the ERP system. The presentation, security, learnability, and navigation of the ERP are all factors in determining service delivery. Users enjoy getting support from a skilled technical team, therefore technical competency and reliability go hand in hand. The ability of ERP to support users to comprehend the requirements, urgency, and importance of users' requests for technical assistance is known as quality service delivery.

5.2.1 System Navigation

Based on the statistical results, it was observed that System Navigation Satisfaction has a negative coefficient in relation to academic service delivery at Masinde Muliro University of Science and Technology. This suggests that as the efficiency of system navigation decreases, academic service delivery tends to increase. System Navigation plays a vital role within the context of Enterprise Resource Planning (ERP) systems. It encompasses the entire customer journey, from building brand awareness to influencing purchase decisions and post-purchase interactions. An efficient ERP System Navigation contributes to better service delivery by ensuring that the university's operations run smoothly. One of the key advantages of effective ERP System Navigation is its ability to streamline and optimize operations. It empowers users to work more efficiently and cost-effectively.

For higher education institutions like Masinde Muliro University, which often have a diverse workforce at various levels, ERP Navigation plays a crucial role. It supports users in managing and monitoring all processes, making it easier to achieve efficiency and cost-effectiveness. This somewhat counterintuitive result suggests that there may be certain complexities or inefficiencies in the current system navigation that could be contributing to better academic

service delivery. It's essential to interpret this result in the context of Masinde Muliro university and its unique operational processes.

To enhance academic service delivery, the university may need to further investigate and understand the specific aspects of system navigation that contribute to this counterintuitive relationship. This analysis could help identify opportunities for system improvements that may lead to even better academic service delivery outcomes. Ultimately, the negative coefficient indicates that there is room for potential enhancement in system navigation practices to support the university's academic service delivery goals.

In summary, while System Navigation Satisfaction has a negative coefficient, these results suggest that enhancing the efficiency of system navigation could be a promising strategy for improving academic service delivery at Masinde Muliro University of Science and Technology.

5.2.2 System Presentation

System presentation plays a pivotal role in the functionality and applicability of the ERP system, particularly in the context of academic service delivery at Masinde Muliro University of Science and Technology. The degree of flexibility and compatibility of the ERP system with other internal systems within the institution, as well as its adaptability to external changes and demands, directly influences its effectiveness in service delivery.

The findings from the logistic regression analysis indicate that system presentation has a statistically significant and positive relationship with academic service delivery. In other

words, when the ERP system is well-presented, it contributes to better academic service delivery.

An effectively presented software system is often regarded as a measure of its quality. To optimize service provision with an ERP system, it is imperative for users, particularly university staff, to have a strong understanding of how to use the software efficiently. Familiarity with the system enables employees to provide services more efficiently to their academic community.

Furthermore, employees should have a clear understanding of how their roles and responsibilities within the institution align with those of other departments. This alignment enhances the overall value brought to the various facets of the university.

While the findings suggest that system presentation is currently adequate for achieving high academic service delivery, there is room for further improvement. Strengthening system presentation can lead to even more enhanced academic service delivery.

These results align with systems theory, which emphasizes the importance of the ERP system's flexibility and compatibility, both internally and externally, for the seamless and effective functioning of academic service delivery. This implies that enhancing system presentation can have a significant impact on the overall quality of academic services provided by Masinde Muliro University of Science and Technology.

System presentation of ERP system is linked to functionality or applicability of the system in the academic service provision. The flexibility and compatibility of the ERP System with other systems in the institution and its adjustment to suddenly altered external conditions are paramount to its functionality and service delivery. From the findings of this study system presentation was found to be significantly positively related to academic service delivery. The presentation of the software is typically a measure of its quality. To optimize the provision of a service with an ERP system, one must first understand how to use the software. The more familiar employees are with the system, the more efficiently they can provide services for their customers. Employees also need to be aware of how to use their roles in relation to other departments within their company so that they can bring value to those departments as well using ERP systems. These results imply that though system presentation is adequate to engender high academic service delivery, there is the need to strengthen system presentation further to enhance maximal academic service delivery. These findings and arguments submit to systems theory which would call for the flexibility and compatibility of the ERP system to internal and external facets of the institution are crucial for the wholesome functioning of academic service delivery.

5.2.3 System Security

System security serves as a foundational element in fostering user trust and confidence within the ERP platform. The assurance of system security is fundamental in upholding the confidentiality and privacy of data, as well as ensuring seamless interactions with other existing applications, all of which are integral to effective service delivery. Maintaining robust

system security is pivotal in safeguarding and enhancing academic service delivery, both within and outside the institution.

The findings derived from the logistic regression analysis reveal a positive and statistically significant correlation between system security and academic service delivery. This outcome underscores the paramount importance of prioritizing system security in the context of enterprise resource planning systems.

ERP systems form the backbone of modern organizations, enabling them to carry out day-to-day operations with efficiency. These systems offer a myriad of benefits, including data security, improved customer service, and remote access to essential data. However, realizing these advantages hinges on organizations' ability to harness ERP systems effectively to optimize their operations.

Security stands out as one of the critical dimensions of ERP systems. It serves as the bulwark for data confidentiality and privacy, particularly when interfacing with other systems and applications. Robust security measures are imperative to prevent unauthorized access, whether from external sources or unauthorized personnel within the organization. Key requisites for robust ERP system security encompass high availability, data integrity, confidentiality, and privacy safeguards.

Furthermore, comprehensive access control, attribution, and accountability mechanisms are pivotal to monitor employee actions and ensure the integrity of the system. A secure interface between the ERP system and other data-sharing applications and systems is indispensable. This ensures that sensitive information remains inaccessible to unauthorized users and even to

employees without the requisite permissions. Additionally, the ERP system should be equipped to raise alerts in response to security breaches or attempted unauthorized access, enabling immediate corrective actions to be taken.

In sum, system security serves as the bedrock for safeguarding data access, maintaining credibility, and is a vital component of overall ERP security. The findings of this study align with SERQUAL, emphasizing that service quality can be evaluated based on how organizations meet or exceed customer expectations, particularly in the context of system security and data protection. The importance of system security in maintaining academic service delivery cannot be overstated, making it a crucial aspect of ERP systems.

5.2.4 User Knowledge

The establishment of user knowledge represents a strategic tool that organizations can wield to enhance their service delivery capabilities. Notably, user knowledge has emerged as a key driver in organizations, fostering heightened awareness and commitment. This, in turn, addresses the challenges associated with system usage stemming from the lack of training in existing hardware, software, and related technologies. The imperative of cultivating user knowledge holds significant promise for bolstering academic service delivery.

The findings derived from this logistic regression analysis reveal a positive and statistically significant correlation between user knowledge and academic service delivery. These results affirm the pertinence of investing in fostering user knowledge, thus engendering higher levels of service delivery.

ERP systems play a pivotal role in organizational operations and service management. However, a recurring challenge with many ERP systems is their steep learning curve, hindering usability. Herein, service providers and ERP vendors can play a pivotal role in rendering ERP systems more learnable. Their involvement in configuring ERP systems and providing training for employees is instrumental in simplifying the learning process, enabling employees to acquire the necessary skills for improved efficiency.

In sum, the results underscore the collective contribution of various aspects within the ERP system, including system navigation, system presentation, system security, and user knowledge, toward academic service delivery. Consequently, it is incumbent upon the institution to optimize system navigation, system presentation, system security, and user knowledge, as these factors emerge as critical predictors for academic service delivery.

5.3 Conclusion

Based on the findings of this study, several conclusions can be drawn. The study investigated the relationship between various ERP constructs, specifically system navigation, system presentation, system security, and user knowledge, in the context of academic service delivery at Masinde Muliro University of Science and Technology. The study concludes that these constructs play a crucial role in enhancing academic service delivery at the institution. The findings demonstrate that these constructs, both jointly and independently, have a significant impact on academic service delivery, emphasizing their importance. Therefore, it is recommended that the university formulate and promote ERP-oriented policies, with a focus on their implementation, to leverage the positive influence of these constructs on academic service delivery. This study provides strong support for the notion that ERP constructs are

pivotal precursors for academic service delivery. It implies that system navigation, system presentation, system security, and user knowledge, when embraced and optimized by the institution, can substantially improve academic service delivery.

5.4 Recommendations.

The findings of this study and the insights from the literature review underscore the importance of strengthening the ERP system within the university to enhance academic service delivery. While acknowledging the relevance of other factors affecting academic service delivery, the following recommendations are made based on the results:

Enhance System Navigation. Despite its negative coefficient, further exploration is needed to understand the specific inefficiencies or complexities within the current system navigation that contribute to better academic service delivery. The university should investigate areas for system navigation improvement to support its academic service delivery goals effectively.

Strengthen System Presentation. Given the positive relationship between system presentation and academic service delivery, it is recommended that the university focuses on enhancing the presentation of the ERP system. This can lead to even higher levels of academic service delivery by providing a better user experience.

Prioritize System Security. The positive correlation between system security and academic service delivery highlights its significance. The university should continue to prioritize and invest in robust system security measures to maintain data confidentiality, privacy, and the integrity of its academic service delivery.

Foster User Knowledge. Recognizing the positive impact of user knowledge on academic service delivery, the institution should encourage and invest in user training and knowledge enhancement. This will empower staff and students to use the ERP system more effectively, ultimately improving service delivery.

5.5 Area for Further Research

While this study provides valuable insights, there are opportunities for further research to gain a more comprehensive understanding of the ERP constructs in diverse contexts. Future research could explore:

Organizational policies and ERP Impact. Investigating how organizational policies mediate the relationship between ERP constructs and service delivery in academic and non-academic settings.

Longitudinal studies. Conducting longitudinal studies to assess the sustained impact of ERP system improvements on academic service delivery over time.

User Feedback and System Enhancements. Gathering user feedback to pinpoint specific areas within the ERP system that require improvement and tracking the outcomes of these enhancements on service delivery.

Comparative studies. Comparing the influence of ERP constructs on service delivery across different universities or institutions to identify best practices and unique challenges.

These areas for further research can contribute to a deeper understanding of how ERP systems can be leveraged to optimize academic service delivery and improve outcomes for universities and institutions.

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APPENDICES

APPENDIX I: UNIVERSITY INTRODUCTION LETTER

KISII UNIVERSITY

(ISO 9001:2008 Certified Institution)

ELDORET CAMPUS

OFFICE OF THE DEPUTY DIRECTOR-ACADEMIC AFFAIRS

Phone: 020-2610479 P. O. Box 408- 40200

Email:eldoretcampus@kisiiuniversity.ac.ke ELDORET-KENYA

16th JULY, 2018

TO WHOM IT MAY CONCERN " -

Dear Sir / Madam,

RE: RESEARCH DATA COLLECTION PERMIT.

ALBERT KIPTUM TARUS MIN12/20724/16

The above named is a bonafide student of Kisii university- Eldoret Campus pursuing a **Master's Degree in Information Systems** in **the faculty of Information Science and Technology.**

He is working on his research entitled "***Evaluating Effects of Enterprise Resource Planning Systems on Academic Service Delivery in Masinde Muliro University of Science and Technology, Kenya.***" in partial fulfilment for the requirement of the Award of Masters in **Information Systems.**

We are kindly requesting your office to provide him with the permit to proceed to the field for data collection and completion of his research.

Please do not hesitate to call the undersigned for any verification.

Any assistance extended to him will be highly appreciated.

Yours faithfully,

16 JUL 2018

Dr. Charles O. Ongiyo (0720986205)

DEPUTY DIRECTOR – ACADEMIC AFFAIRS

APPENDIX II: KREJCIE AND MORGAN TABLE

Krejcie and Morgan Table

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

APPENDIX III: QUESTIONNAIRE FOR STUDENTS

My name is Albert Tarus. I am a postgraduate student at **Kisii University** and am researching ***"Evaluating usability enterprise resource planning system on academic service delivery in Masinde Muliro of Science and Technology University, Kenya"***. As a responder, you have been chosen to take part in this research. Your provided information will be used exclusively for academic reasons and will be handled with the utmost secrecy. Enter your answers in the designated slots for every item on the questionnaire.

SECTION A: DEMOGRAPHIC INFORMATION

(Please tick your answers in the boxes provided)

1. What is your gender?
    - Male
    - Female
2. What is your age bracket?
    - Below 19 years
    - Between 20 and 23 years
    - Between 24 and 25 years
    - Over 25 years
3. Which year of study are you in?
    - Year one
    - Year two
    - Year three
    - Year four
    - Year five

SECTION B: SYSTEM NAVIGATION

How much do you agree with the following claims about how Masinde Muliro University of Science and Technology's academic service delivery is impacted by the ERP system? Kindly utilise the supplied scale: The numbers 1 through 5 represent strongly disagree, disagree, agree, and remain unsure.

4. The ERP system is user-friendly and easy to navigate.
5. The ERP system rarely has errors or issues.
6. The ERP system effectively organizes and presents information.
7. The ERP system can handle a large amount of data effectively.
8. On a scale of 1 to 10, please rate your overall satisfaction with the ERP system's navigation:

SECTION C: SYSTEM PRESENTATION

Do the following assertions about how the ERP system presentation affects educational delivery of services at Masinde Muliro University of Science and Technology University make sense to you? Kindly utilise the supplied scale: The numbers 1 through 5 represent strongly disagree, disagree, agree, and remain unsure.

9. The ERP system adapts quickly to changing conditions.
10. The ERP system considers individual user needs.
11. The ERP system is responsive to user feedback.
12. The ERP system is compatible with other systems at the university.
13. On a scale of 1 to 10, please rate your overall satisfaction with the ERP system's presentation:

SECTION D: SECURITY

How much do you agree with the following claims about how security impacts Masinde Muliro University of Science and Technology University's academic service delivery? Kindly utilise the supplied scale: The numbers 1 through 5 represent strongly disagree, disagree, agree, and remain unsure.

12. The ERP system ensures that personal information is secure and accessible only by authorized users.
13. The ERP system is reliable and dependable.
14. The ERP system is genuine and authentic.
15. The ERP system can resolve disputes effectively.
16. On a scale of 1 to 10, please rate your overall satisfaction with the ERP security measures in place:

SECTION E: USER KNOWLEDGE

Do you think the following claims about how user knowledge affects academic service delivery at Masinde Muliro University of Science and Technology University are accurate? Kindly utilise the supplied scale: The numbers 1 through 5 represent strongly disagree, disagree, agree, and remain unsure.

17. Students are familiar with the ERP systems used at the university.
18. ERP systems help students understand information and data effectively.
19. Students have sufficient knowledge to use the ERP system.
20. The university offers adequate training to help students become proficient in using the ERP system.

21. On a scale of 1 to 10, to what extent are you satisfied with ERP system learnability on academic service delivery at Masinde Muliro University.

SECTION F: ACADEMIC SERVICE DELIVERY

How much do you agree with the following claims about Masinde Muliro University of Science and Technology's academic service delivery? Kindly utilise the supplied scale: The numbers 1 through 5 represent strongly disagree, disagree, agree, and remain unsure.

22. There is faster processing of customer requests.
23. There is ease of access to information without going to the university.
24. . Clients can easily give feedback on service delivery.
25. . There is frequent unavailability of service due to network failure.
26. On a scale of 1 to 10, To what extent are you satisfied with academic service delivery at Masinde Muliro University?

APPENDIX IV: INTERVIEW SCHEDULE FOR STAFF TECHNICIANS AND HEADS OF DEPARTMENTS

My name is Albert Tarus. I am a postgraduate student at **Kisii University** and researching ***"Evaluating usability of enterprise resource planning system on academic service delivery in Masinde Muliro of Science and Technology University, Kenya"***. As a responder, you have been chosen to take part in this research. Your provided information will be used exclusively for academic reasons and will be handled with the utmost secrecy. Enter your answers in the designated slots for every item on the questionnaire.

Usability of ERP System at MMUST

I. Introduction

A. Greeting and Introduction

- "Hello, my name is Albert Tarus, and I'm a postgraduate student at Kisii University. I'm conducting research on the usability of the Enterprise Resource Planning (ERP) system at Masinde Muliro University of Science and Technology. Your participation is invaluable to this study."

B. Informed Consent

- "The information provided will be treated with confidentiality and used for academic purposes. Your willingness to participate is greatly appreciated."

II. Demographic Information

1. Gender: "Let's start with some basic demographic information. Could you please indicate your gender?"
    - Male [ ]
    - Female [ ]
2. Age Bracket: "Now, could you tell me your age bracket?"
    - 21-30 years [ ]

- 31-40 years [ ]
- 41-50 years [ ]
- Over 51 years [ ]

3. Level of Education: "What is your highest level of education?"
    - Primary [ ]
    - Secondary [ ]
    - College [ ]
    - University [ ]
4. Length of Employment at the University: "How long have you worked at Masinde Muliro University of Science and Technology?"
    - Less than 5 years [ ]
    - Between 6-8 years [ ]
    - Between 9-11 years [ ]
    - Over 12 years [ ]

III. System Navigation: "Now, let's discuss the usability of the ERP system. For each statement, please rate your level of agreement on a scale from 1 to 5,: 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree.

- ERP systems ensure the adaptability of information/data [ ]
- ERP systems ensure information/data relevance [ ]
- ERP system ensures concise representation of data/information [ ]
- ERP system ensures storage of a large amount of data [ ]
- On a scale of 1 to 10, please rate your overall satisfaction with the ERP system's navigation

IV. System Presentation: "Moving on to the presentation of the ERP system. Please rate your level of agreement on the same scale for the following statements: 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree."

- ERP systems enhance the responsiveness of the information/data [ ]
- ERP systems enhance understanding of the information/data [ ]
- ERP systems are information/data considerate [ ]
- The ERP System is compatible with other systems in the institution [ ]
- On a scale of 1 to 10, please rate your overall satisfaction with the ERP system's presentation

V. Security: "Now, let's discuss the security aspects of the ERP system. Please rate your level of agreement for these statements: 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree.

- ERP systems ensure information/data consistency [ ]
- ERP systems ensure information/data safety [ ]
- ERP systems ensure information/data reliability [ ]
- ERP systems ensure information/data authenticity [ ]
- On a scale of 1 to 10, please rate your overall satisfaction with the ERP security measures in place

VI. Learnability: "Let's talk about the learnability of the ERP system. Please rate your level of agreement on the following statements: 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree.

- ERP systems used by students are familiar [ ]
- ERP systems enhance understanding of the information/data [ ]
- Students are knowledgeable in using the ERP system [ ]
- The school offers training to the users of the ERP system to be familiar with how to use the system [ ]
- On a scale of 1 to 10, to what extent are you satisfied with ERP system learnability on academic service delivery at Masinde Muliro University.

VII. ACADEMIC SERVICE DELIVERY

Let's finally discuss how ERP affects the provision of academic services. How much do you agree with the following claims about Masinde Muliro University of Science and Technology's academic service delivery? Kindly utilise the supplied scale: The numbers 1 through 5 represent strongly disagree, disagree, agree, and remain unsure.

12. There is faster processing of customer requests.
13. There is ease of access to information without going to the university.
14. Clients can easily give feedback on service delivery.
15. There is frequent unavailability of service due to network failure.
16. On a scale of 1 to 10, To what extent are you satisfied with academic service delivery at Masinde Muliro University?

VIII. Closing

A. Thank You

- "Thank you for your valuable input and for participating in this interview. Your insights are essential to the success of this research."

B. Additional Information

- "Is there any additional information or comments you'd like to share related to the ERP system or this study?"

C. Conclusion

- "Our interview is now concluded. If you have any further questions or thoughts, please feel free to reach out to me using the contact information provided. Your contribution is highly appreciated."

APPENDIX V: NACOSTI PERMIT

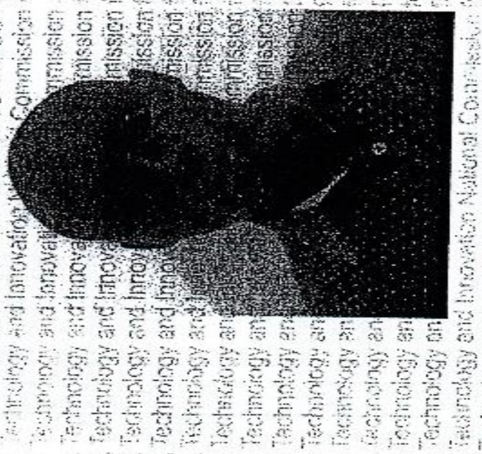
THIS IS TO CERTIFY THAT:
MR. ALBERT KIPTUM TARUS
of KISII UNIVERSITY, 0-30100
Eldoret,has been permitted to conduct
research in Kakamega County

on the topic: EVALUATING THE EFFECTS OF ENTERPRISE RESOURCE PLANNING SYSTEM ON ACADEMIC SERVICE DELIVERY IN MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY, KENYA

for the period ending:
17th August,2019

Applicant's
Signature

Permit No.: NACOSTI/P/18/62418/24582
Date Of Issue: 18th August,2018
Fee Recieved :Ksh 1000



Director General
National Commission for Science,
Technology & Innovation

APPENDIX VI: PLAGIARISM REPORT

EVALUATING THE USABILITY OF ENTERPRISE RESOURCE PLANNING SYSTEM ON ACADEMIC SERVICE DELIVERY AT MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY, KENYA

ORIGINALITY REPORT

20%	17%	6%	9%
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