EVALUATING THE RELATIONSHIP BETWEEN DIGITALIZATION AND PUBLIC SERVICE DELIVERY IN PUBLIC UNIVERSITIES, A CASE OF PUNTLAND STATE UNIVERSITY, SOMALIA.

YUSUF IBRAHIM SALAH

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE DEGREE OF MASTERS OF ARTS IN PUBLIC ADMINISTRATION AND MANAGEMENT OF MOUNT KENYA UNIVERSITY

OCTOBER 2024

DECLARATION AND APPROVAL

This project is unique and has not been previously acknowledged or recognized by

any other university.

Signature:..... Date: 24th / October /2024

Yusuf Ibrahim Salah

MPAM/2019/48418

As the student's supervisor, I endorse the submission of this research project.

Signature:..... Date: **24st /October /2024**

Dr. Ruthwinnie Munene

Lecturer,

Accounting and finance

Mount Kenya University

DEDICATION

To my beloved wife, Anisa Mire Yusuf: your unwavering support and patience were vital to the success of this research.

ACKNOWLEDGMENT

I am immensely grateful to all those who contributed significantly to this research project. I would like to extend a heartfelt thank you to my supervisor, Dr. Ruthwinnie Munene, for her exceptional guidance, continuous encouragement, and strong support throughout this journey. Her profound expertise, valuable insights, and constructive feedback have significantly shaped this research. Her mentorship has been essential in my growth as a researcher.

I also want to express my heartfelt gratitude to my family and friends for their unwavering support and encouragement. Their constant presence, love, understanding, and belief in my abilities have been a constant source of motivation.

Lastly, I am sincerely grateful to all those who contributed to the successful completion of this research project.

ABSTRACT

Digitalization has undergone significant evolution, transitioning from a role of administrative support to becoming a strategic force within organizations. It now impacts governance and education, fostering innovation. By adopting digital practices, universities can break physical boundaries, engage with a global student base, and position themselves as international education providers. Digitalization has notably enhanced service efficiency in public universities. This study focused on assessing how digitalization affects the delivery of services at Puntland State University in Puntland, Somalia. It aimed to investigate the resources currently utilized in digital programs and their effectiveness in enhancing service delivery at public universities in Puntland. Additionally, the research evaluated the availability and impact of digital services for students at Puntland State University. It further explored the degree of change digitalization has introduced at the university and identified the challenges faced in implementing digital services. The study employed a case study approach centered on Puntland State University, involving 61,946 students, 10 department heads, and 5 digital department officers, selecting 221 individuals as respondents. Data were gathered through questionnaires and analyzed using a descriptive survey approach. Statistical evaluations were performed with SPSS, applying both descriptive and inferential statistics, and results were displayed via means, tables, frequency distributions, and percentages. The findings showed a moderate positive correlation between the quality of resources and service delivery in Puntland's public universities, with a correlation coefficient of 0.476 ($p < 0.05$). Likewise, digital services and service delivery exhibited a moderate positive significant correlation, with a correlation coefficient of 0.458 ($p < 0.05$). The degree of digitalization was also found to have a moderate positive correlation with service delivery, as indicated by a correlation coefficient of 0.485 ($p < 0.05$). Furthermore, the research found a moderate positive significant correlation between the challenges associated with digitalization and service delivery, showing a correlation coefficient of 0.479 ($p < 0.05$). The study concluded that the four independent variables—resource status, access to digitized services, digitalization level, and digitalization challenges—accounted for 78.6% of the variation in service delivery at Puntland's public universities in Somalia. The other 21.4% of the variance was due to additional factors. Drawing from the findings, the researcher suggested boosting the provision of digital resources, improving student access to digitized services, broadening the scope of digitalization to enhance service delivery, and tackling digitalization challenges at Puntland State University. It was also recommended that future studies should concentrate on the obstacles of digitalization and explore strategies to overcome them to further enhance service delivery at public universities in Puntland State University.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Khan (2015) noted that digitalization encompasses the utilization of technological tools and communication channels to streamline access to information and data. Furthermore, the incorporation of Information and Communication Technologies (ICT) has transformed the efficient production and delivery of services. Consequently, digitization can create a foundation for distributed governance, improving all facets of stakeholder interactions. It supports various activities including data storage, processing, exchange, distribution, accountability, and other vital elements of current business operations.

Digitalization has progressively changed how public services are delivered, leading to the development of e-governments that utilize a distributed resources approach. According to Putra et al. (2018), the advent of the digital era has led to the creation of e-government, enabling governments to develop strategies that improve public service delivery through various multi-channel platforms. Sascha, Paul, and Norbert (2021) highlighted that merging information and communication technologies (ICT) with citizen data has facilitated the creation of e-governments. Governments aiming to remain competitive globally in public service delivery are focusing on training, developing infrastructure, and synchronizing their strategies with digital transformation.

Additionally, the combination of digitization with strategic initiatives has notably enhanced the delivery of government services. Implementing such strategies digitally requires a well-coordinated effort from all involved stakeholders to

guarantee a smooth execution without discrepancies. For instance, government bodies and public companies need to be thoroughly prepared to integrate all essential processes, which helps to streamline service delivery and minimize the time people spend on-site. Thompson and Strickland (2018) argue that any strategic initiative that does not reduce initial costs is considered ineffective.

In the 1990s, there was significant expansion in computer communications and information accessibility, largely driven by the growing use and widespread adoption of internet-based services like email and the World Wide Web (WWW). This era also saw CD-ROMs become the preferred method for distributing packaged software, taking over from the once ubiquitous floppy disks. These technological advances prompted educators to reevaluate their methods, placing greater emphasis on leveraging technology to enhance student learning, and offered a solid justification for investments in educational technology.

When exploring the integration of computer systems into educational settings, it's essential to acknowledge the deep connections between schools, learning, and computer technology. Initially, when computers were introduced into schools, there was a widespread assumption, highlighted by Mevarech and Light (2014), that computers would assume the role of the main instructor. This belief suggested that computers might replace the traditional roles of teachers, akin to robots replacing manual labor in industries. Such views, as outlined by Collis (2017), conjured a bleak picture where children might be found sitting alone, engaging only with computers rather than human teachers.

It is important to understand that the role of computer technology in education has moved away from the idea of replacing teachers. As perceptions have evolved,

there is now a broader understanding of technology as a powerful tool that can enhance and support teaching and learning experiences. Instead of separating students with computers, the focus has moved to achieving a balanced integration of human instruction and technological resources. This approach aims to foster a dynamic and interactive learning environment where technology complements traditional teaching methods.

The progress in computer technology has created new opportunities for interactive and collaborative learning, allowing students to tap into vast information resources and enhancing communication and collaboration between students and educators. Teachers have transitioned into the role of facilitators, helping students navigate and utilize technology to gain knowledge, develop critical thinking skills, and participate in enriching learning experiences.

In summary, the 1990s saw substantial advancements in computer communications and information accessibility, driven by the emergence of internet-based services and the debut of CD-ROMs. The education sector adapted by acknowledging technology's capacity to improve student learning. Initially, there was a belief that computers might supplant teachers, but the prevailing view now sees technology as a supplementary tool that enhances the functions of both teachers and students. This integration fosters an interactive and cooperative learning atmosphere, merging the benefits of human instruction with technological support.

Digitalization has brought about substantial changes in the educational sector, significantly impacting teaching, learning, and research (Yusuf, 2015). Extensive studies, such as those by Al-Ansari (2016), have demonstrated the positive effects of digitalization on educational quality. Digitalization offers vast opportunities for

fostering innovation, speeding up learning, enriching educational experiences, and advancing skill development. It is pivotal in motivating students, linking educational experiences with real-world applications, and generating economic prospects for future workforce members. Additionally, digitalization improves teaching techniques and drives essential transformations in educational settings, as noted by Davis and Tearle (2019) and Lemke and Coughlin (2018), cited in Yusuf (2015). The notable impact of digital tools, especially computers in education, has been extensively documented and analyzed, according to Jhurree (2015).

Originally, computers were mainly utilized for teaching computer programming, but the introduction of the microprocessor in the early 1970s made microcomputers more affordable and increasingly common in schools. As computers and technology became more prevalent in society, there grew a significant concern about the need for computing skills in daily life. Hepp, Hinostroza, Laval, and Rehbein (2014) argue in their work "Digitalization in Schools: Education, ICT, and the Knowledge Society" that although computers have been part of education since their inception, their widespread use was not initially evident. At that time, although computers were not fully integrated into the standard curriculum, there was a strong belief that education systems should prepare individuals for lifelong learning in an information-driven society. This belief significantly boosted interest in information and communication technologies (ICTs), as noted by Pelgrum, W.J., and Law N. (2018).

The implementation of information and communication technologies signifies a major transformation in the relationship between government and society, as well as how society engages with the government. By digitizing services and reducing

bureaucratic procedures, governments can make substantial improvements. Implementing policies that promote digital transformation paves the way for establishing more inclusive, efficient, and effective service delivery practices. This offers a chance for governments to transform how services are facilitated, creating a more efficient and accessible experience for citizens. Fundamentally, the embrace of digital technologies gives governments significant potential to improve their operations and raise the standard of service delivery.

Recognizing that digital transformation happens within the context of institutional change is crucial, influenced by the preferences of various stakeholders. This context often leads to challenges such as coordination issues, conflicting priorities, and uneven change processes typical in digital transformations. Therefore, understanding the importance of effective governance is key to developing coherent policies that significantly influence the redesign and enhancement of public services. Essentially, establishing a strong governance framework is critical for navigating complex decision-making and ensuring the uniform and fair implementation of digital transformation policies (Filgueiras et al., 2019).

The public service plays a crucial role in governing public affairs, acting as a bridge between citizens and the state. It is essential for promoting public interest and improving the welfare of both the public and the state. Its primary responsibility is to ensure fair and impartial access to government resources for all citizens. This includes protecting lives and property, providing access to social services, and maintaining freedoms of movement, association, and expression. Ultimately, the public service must always prioritize the public's interests and welfare (Med Uottawa, 2015).

The digitization of the economy and society, accelerated by the COVID-19 pandemic, has significantly influenced the interpersonal dynamics of public services, offering benefits and challenges. Five key trends have emerged: notably, the transition from in-person to online and hybrid educational models has broadened access to education, overcoming previous personal or geographical barriers, and allowing for integrated participation of online and in-person students. However, the increased use of digital services and artificial intelligence in supporting vulnerable adults raises concerns about potential depersonalization, threatening their independence and autonomy, and risking patronizing or infantilizing treatment.

The second trend emphasizes that users of public services now have the ability to access information about their services online, diminishing the control that professionals once had over information and knowledge. This enhanced accessibility has simplified the way users interact with services. However, there are concerns that "algorithmic decision-making" could replace professional expertise and judgment, potentially leading to negative outcomes. Additionally, ethical issues have emerged regarding the increasing use of digital technology to share personal information among public service providers.

The third trend emphasizes employing digital technologies to boost the efficiency of public services, highlighted by improvements in healthcare technology. The goal of these innovations is not to supplant public services but to enhance their performance and impact. Nevertheless, robust governance is crucial to maximize the benefits of these technologies and ensure they positively affect services.

The fourth trend underscores the significant improvements in citizen access to public services through digital innovations. Examples include patients being able to independently book appointments with doctors or access their medical test results online quickly. However, these advancements risk leaving behind those with limited digital literacy or access, potentially increasing the digital divide.

The fifth trend centers on the importance of back-office digital innovations that, although not visible to users, greatly improve service delivery efficiency. These include technologies for managing payroll, employee relations, and inventory control. While these systems are not directly seen by users, they play a crucial role in boosting operational efficiency. The effect of digital technology and AI on public service management and delivery is neutral, dependent entirely on how the technology is applied and implemented. These challenges raise important questions for the theoretical understanding and practical implementation of public service management, prompting scholars like Osborne et al. (2022) to delve deeper into these issues.

Global Perspective on Digitization on Service Delivery

Studies in the United, as highlighted by Sears (2016), indicate that university leaders need to cultivate specific technological skills to successfully integrate technology into their administrative operations. These leaders are pivotal in advancing digitalization within their institutions by supporting the development of computer technology literacy among both faculty and students, thereby improving the overall educational experience. Consequently, it is vital for university leaders to ensure that all members of the academic community are proficient, meaning they can effectively and safely use digital and computer technologies, as defined by

Hague and Williamson (2009). Furthermore, university administrators are encouraged to set up digital communication platforms, like university websites, to enhance interpersonal relationships among colleagues. Nonetheless, as Aldojan (2017) points out, there is still potential to improve the ways educational leaders communicate through these digital channels.

In the United Kingdom, digitalization is primarily used by higher education institutions to provide services to distance learners, as Kirkwood & Price (2015) observed. However, it's important to recognize that only a minority of students have highly developed information literacy skills. Rajeev (2018) points out that digitalization has significantly reduced operational inefficiencies and enhanced decision-making across various governance areas. A progressive idea is the development of an Integrated Higher Education Service System, which would allow governing authorities to efficiently manage the enactment of national education policies and improve service provision to a wide range of stakeholders.

In Norway, universities have widely adopted computers within their administrative functions for various tasks, including sharing internal memos, processing admission forms, and accessing student records and learning materials through online platforms (Breivic, 2020). According to research by Hossein (2018), digitalization provides a multitude of benefits for educational administrators in performing their roles. The author highlights how communication and information systems have significantly transformed higher education by enhancing the ways in which information is transferred, stored, retrieved, and processed, involving staff, students, and other stakeholders. Furthermore, Hossein cites studies that demonstrate how the adoption of digital services has significantly improved managerial effectiveness and

efficiency.

According to the National Center for Education Statistics (NCES, 2020), the integration of digital technologies in universities has greatly improved the quality of their educational programs. It has successfully addressed various challenges, facilitating more effective communication among educators (O'Neil & Perez, 2012; Pasquerilla, 2018), and encouraging university leaders to integrate digital solutions into their administrative operations. Maki's 2018 study in Minnesota, USA, emphasized the essential role of digitalization in enhancing management and leadership efficiency within the education sector. The research explained how technology is utilized in different aspects of university administration, such as managing students and allocating resources. Digital systems in academic institutions facilitate the integrated and real-time processing of information, significantly boosting the ability to manage and maintain large data volumes. These technologies are applied across various departments, including management of student and faculty data, tracking of inventory and assets, managing facilities, transportation services, library operations, staff records, payroll, and handling student fees.

Maki (2018) identifies several key areas managed by the administrative subsystems of higher education institutions, including personnel, student management, resources, finances, and overarching administrative activities. Likewise, Ulf Fredriksson and Elżbieta Gajek (2019) observed that digital tools are mainly used for communication and general administrative tasks within the management of educational organizations. Thus, the literature indicates that administrative responsibilities in higher education cover the management of student services, staff,

resource distribution, communication, and overall administration tasks.

Digitalization in the education sector consolidates all data and operations of an educational institution into a cohesive, single system. This integration enhances functionality, making it more streamlined, well-organized, and accurate. These platforms are crafted to be user-friendly, aiming to save time and cut costs while offering the adaptability needed to navigate shifts in the education sector. Educational institutions face a wide array of needs that encompass digitizing and managing processes like registration, admissions, student records, scheduling classes, transportation, attendance tracking, library operations, fiscal oversight, exams, monitoring performance, grading, hostel administration, security, and producing reports. Typically, software vendors present an assortment of modules, allowing schools to select the options that most closely align with their unique needs.

Regional Perspective on Digitization and Service Delivery

In East Africa, the adoption of digitalization has effectively bridged distances and made global connectivity easier (Kuo, 2015). In today's fast-paced and constantly changing world, digitalization in service delivery entails developing systems that address various levels of institutional and relational power. This is facilitated through the implementation of an electronic governance (e-governance) model, utilizing various Internal Information Systems (IIS). In the education sector, digitalization aids in the application of e-governance, using advanced technology to create a comprehensive system for managing university administrative functions. This integrated system is crucial for efficiently resolving academic challenges and ensuring smooth operations within educational institutions. In Kenya, digital

advancements have significantly improved service delivery in universities, a development bolstered by the formation of several education commissions, including findings from the Kamunge Report in 2018, the Mungai Report in 2015, and the Koech Report in 2019.

Digitalization has been primarily aimed at transforming academic institutions to establish a learning environment that is both flexible and accessible for students. In Kenya, there has been significant adoption of digital technology in university administrative functions, including online fee payments, academic course registration, accommodation booking, access to student results, interactions between students and instructors, and providing additional resources via web platforms.

Numerous studies have explored the impact of digitalization in classrooms on student skills and outcomes, expanding to include the effects of online educational tools like platforms, digital devices, blogs, and wikis on student performance. These tools are influenced by device ownership, connectivity, and digital literacy. However, prior research often neglected the role of institutional factors, e-technology, and e-management in transforming service delivery in Kenya's public universities. This research also sought to identify challenges in implementing e-governance and develop strategies to overcome them. Digital platforms and technologies are critical for managing and securing information in various formats. The digitization process has significantly enhanced how governments create and deliver services to citizens, with the use of Information and Communication Technology improving speed, transparency, and efficiency across government sectors (Beynon, 2018).

The Kenyan government recognizes the vital importance of land as both a resource and a production factor and has implemented legislative measures to enhance land transactions through the National Land Information System. Research by Hallaq, Rothman, and Christoplos (2018), along with the World Bank Economic Report (2018) and Heeks (2019), highlights that Kenya contends with challenges stemming from outdated, predominantly paper-based land administration systems that are widespread across the nation's land offices. Okoth (2015) points out that these systems in Kenya are marked by inefficiencies, being time-consuming, unreliable, unaccountable, overly restrictive, and expensive, thus hindering effective service delivery.

Clerk (2017) describes digitalization as the use of digital technologies to overhaul business models, processes, and revenue collection, enhancing automation and the sharing of crucial static information for service delivery. Daniels (2017) observes that Information and Communication Technologies (ICTs) have become essential in modern society, prompting many countries to treat basic digital skills in education as fundamental as traditional literacy and numeracy skills.

A study carried out in Kenya investigated the effects of digitalization strategies on public service delivery within the Ministry of Land. The findings emphasized the importance of considering the organization's infrastructure deficiencies and specific digital needs when developing a digitization strategy. It highlighted the critical role of aligning the organization's strategic needs with the technical specifications of the system being implemented, ensuring the system fulfills the required functions and infrastructure demands. The study also highlighted that organizational capacity building and bureaucratic procedures can cause discrepancies between anticipated

and actual outcomes. Tackling these challenges is essential for the effective execution of a digitization strategy and for the efficient delivery of public services (Mwanza, 2021).

Local Perspective on Digitization and Service Delivery

Over the last ten years, digitalization has profoundly reshaped Somalia's educational sector, prompting the implementation of policies to manage student data securely and effectively. This technological shift has introduced numerous student services including distance education, cost-effective printing, cellular plans, internet access, free dial-up, tech equipment, and classroom media rentals. These advancements have significantly improved secondary education quality by providing teachers and students with essential online resources, enhancing learning outcomes. Moursund (2015) emphasized digitalization's critical role in linking theory with practice, especially via developments in computer-assisted learning and distance education.

Today, computers with internet connectivity are a staple in many households, providing students with ready access to a wide range of resources. These encompass educational resources designed to aid instruction and support learning. Additionally, students have access to various communication tools and reference materials, including email, web browsing, encyclopedias, and books. Beyond educational tools, computers also offer access to a variety of entertainment options, including non-educational games, as well as electronic educational resources like e-books and academic journals.

Digitalization enhances the access, storage, and analysis of educational materials. Virtual libraries provide electronic books and journals, offering students a wide

array of resources in digital formats. This study examines the role of Information and Communication Technology (ICT) in improving education quality in secondary schools. Over the past two decades, universities worldwide have significantly invested in digitalization, acknowledging its profound impact on educational service delivery (Adel, 2018). The widespread use of personal computers has reinforced the belief that digitalization can elevate educational quality, increase student satisfaction, and address various challenges. Additionally, e-governance, the use of digital technologies in government and public sectors, has effectively enhanced governance at multiple levels and in various settings.

Recently, there has been a global trend towards integrating digitalization in universities to enhance their educational systems (O'Neil & Perez, 2012). The use of computers offers extensive access to a variety of data, marking a significant transformation in how services are delivered (Isman & Dabaj, 2014).

The push to improve service delivery in educational settings, especially in higher education, has prompted the adoption of digital strategies. Recognizing these methods as cost-effective, the government has utilized online social platforms for service provision and enabled electronic document exchanges, reducing the necessity for in-person visits to service offices (Moore & Tait, 2012).

Digital transformation can enhance the efficiency, effectiveness, and quality of public service delivery, yet research on its impact in developing countries, especially Somalia, is sparse. A 2021 study by Mohamed, A. M. explored public management reform's role in improving service quality in Somalia but did not specifically address digital transformation. This study seeks to fill that void by

examining the influence of digital transformation on public service delivery within the Ministry of Education in Puntland, Somalia.

Service Delivery

Public service delivery is an evolving process that must be continually improved and tailored to meet specific user needs. Lewis and Booms (2018) state that the quality of a service is judged by how well it meets user expectations and its delivery effectiveness. Services are activities designed to satisfy user requirements, and successful service delivery should exhibit qualities like timeliness, reliability, availability, usability, credibility, and flexibility. Digital technologies are crucial for enhancing government operations and are increasingly essential for improving service delivery. Padovani and Pavan (2016) observe that more governments are adopting electronic methods to better meet citizen service demands.

The extensive adoption of technological communication tools like computers and the Internet in public service has led to the emergence of electronic government, a major innovation of the past decade. This development has allowed governments to establish platforms that offer efficient, transparent, cost-effective, and convenient solutions to citizens' issues (Rana et al., 2016). It highlights the critical importance of meeting client needs for business sustainability, necessitating a deep understanding and continuous improvement of organizational processes.

Furthermore, companies need to quickly and methodically pinpoint issues, set dependable service performance metrics, and assess client satisfaction along with other performance indicators. Kundenbindun (2018) argues that utilizing ICT in service delivery enhances service quality and serves as a universal language in business management, indicating the success level in providing structured services.

Ministry of Education in Somalia and Digitalization

In Somalia, a country in the Horn of Africa plagued by conflict, tackling the COVID-19 pandemic has posed significant challenges. With a total of 2,835 confirmed cases so far, the nation has struggled to optimize its scarce resources amid a locust outbreak. To curb the spread of the virus and reduce health risks associated with overcrowded classrooms, the Ministry of Education, Culture, and Higher Education (MOECHE) decided to temporarily halt all classes until the situation gets better. While universities struggled to find solutions, the Somali Research and Education Network (Somali REN) stepped in to offer education through online platforms. However, this initiative faces a significant challenge in a country where less than 10% of the population has access to the internet.

The pandemic has significantly challenged Somalia's education sector, especially as universities depend heavily on private funding. Tuition fees, tied to semester enrollment and exams, often include extra costs. To maintain educational continuity and prevent disruptions, SomaliREN, a national research and education network established in 2009 by six Somali universities, has actively pursued alternative methods to deliver online lectures through virtual classrooms.

SomaliREN aims to advance digital transformation and provide high-speed digital connectivity to educational institutions in Somalia. Its core mission is to enhance affordable, high-speed internet access for both faculty and students. Currently, SomaliREN has connected 20 institutions over 50 campuses to three zonal Points of Presence (PoPs), boasting an international bandwidth of 310 Mbps near Mogadishu. Besides internet and local connectivity, SomaliREN provides access to its data center resources, offering services like video conferencing, server hosting, virtual

training labs, and capacity building. Of the 20-member institutions, seven offers free campus WiFi to students.

Graduate programs are increasingly adopting blended learning methods. The implementation of connectivity across member institutions was aided by the World Bank Group and the Ministry of Post, Telecommunications, and Technology (MPTT). The COVID-19 pandemic forced these programs to quickly shift to online platforms. To maintain quality education, universities have hired experts and professors from abroad to teach courses, allowing them to enroll students from outside their local regions.

Many Somali expatriates have registered for Arabic courses or other subjects taught in Somali through an online platform, which allows them to connect with expert educators without needing to be physically present. This system also enables teachers to offer courses from any location. After a directive to halt all physical classes, SomaliREN rapidly set up this platform and urged universities to adopt it. Currently, 11 out of 20 member universities are actively using this platform for delivering online classes, with the remaining institutions preparing their faculty for its use. Initially established with the support of two World Bank-provided servers in December of the last year, the platform was part of an initiative to link Somali academics abroad with local universities to mitigate the intellectual exodus resulting from extended conflicts. The platform has been instrumental during the COVID-19 pandemic, though scaling it up to accommodate increasing demand continues to be a significant challenge.

In the last ten years, Somali higher education institutions have been diligently working towards digital transformation. While there have been notable

advancements, numerous obstacles still remain. These challenges encompass restricted access to vital network devices such as mobile phones and computers, weak household internet connections, and insufficient support from local operators and service providers to eliminate data costs for educational and research purposes. To prepare for a future economy and education system reliant on remote learning, it is essential to secure reliable internet connectivity and robust digital infrastructure. Effective implementation of advanced educational technology requires investments from both government and private sectors to upgrade the nation's digital framework to cloud-based systems and strong digital networks.

In addition to infrastructure investments, informed policies for higher education and telecommunications are essential. These policies should focus on improving connectivity in remote and hard-to-reach areas and establishing regulatory frameworks that engage the private sector. Creating a collaborative environment between the government, private entities, and educational institutions is crucial for accelerating the digital transformation in Somalia.

The importance of efforts like those of SomaliREN is profound. Through its commitment to maintaining student connectivity with its platform, SomaliREN highlights the urgent need for Somalia to push forward with its digital transformation initiatives. By addressing existing obstacles and adopting digital innovations, Somalia can capitalize on the benefits of remote learning. This advancement will lead to a more inclusive and technologically sophisticated education system, preparing students with the skills needed to meet future challenges.

1.2 Statement of the problem

The adoption of digital technology in delivering public services is becoming crucial in today's fast-evolving world. Digital transformation can significantly improve the efficiency, effectiveness, and quality of public services, addressing the increasing expectations of citizens. However, there is a notable scarcity of research on how digital transformation impacts public service delivery in developing nations, especially in Somalia. This lack of data leads to an incomplete understanding of the essential digital technologies used and their impact on the efficiency, effectiveness, and quality of public service delivery.

Furthermore, challenges like inadequate infrastructure, limited technology access, and resistance to change hinder digital transformation efforts in Puntland, Somalia. While the volume of research on e-governance is growing, much of the academic discussion remains theoretical, with a real need for more empirical studies to evaluate their practical impact. Many higher education institutions, like those you've studied in your own research, still haven't fully integrated digitalization into their administrative routines, leading to outdated record-keeping and sluggish administrative procedures. This problem is becoming increasingly acute as student enrollment rises. Therefore, the adoption of technology in governance is becoming increasingly essential for these institutions to manage their growing demands efficiently.

Moreover, existing research on e-government mainly focuses on developed countries with robust internet infrastructures, often overlooking the importance of studying e-government in less examined developing nations. The global growth of e-commerce underscores the need to explore e-governance in these regions. Despite

this, there is a substantial research gap regarding the resources currently used in e-governance initiatives, their accessibility, the challenges faced in implementing e-governance in public universities, and the strategies needed to overcome these challenges.

Additionally, there is a deficient understanding of how e-governance has reshaped service delivery in public universities, particularly in Somalia. This void presents a substantial chance to enrich academic research in this field, considering the scarcity of studies on the subject. The absence of thorough research might hinder the formulation of effective digital transformation strategies, leading to subpar public service delivery in developing countries. These shortcomings in service provision can significantly affect citizens who rely on these services.

Therefore, this study aims to fill the existing research gap by investigating the state of e-governance resources, the accessibility of electronic governance, and the strategies employed to address these challenges specifically at Puntland State University in Puntland, Somalia. The results of this research will greatly enhance the academic understanding of e-governance in developing countries and aid in developing effective digitalization strategies to improve the efficiency of public service delivery at the university.

1.3 Purpose of the study

This study aimed to evaluate the relationship between digitalization and the efficiency of public service delivery at Puntland State University in Puntland, Somalia.

1.4 Specific Objectives

i. To find out the status of resources used in digitized program on effective service delivery in public universities in Puntland, Somalia.

ii. To establish the student's accessibility to digitized services on service delivery in public universities in Puntland, Somalia.

iii. To find out the extent to which digitalization has transformed service delivery in public universities in Puntland, Somalia.

iv. To explore strategies to address the challenges encountered in implementing digitalization for service delivery in public universities in Puntland, Somalia.

1.5 Research Questions

i. Which resources are utilized to enhance provision of service in Puntland State University in Puntland, Somalia?

ii. What is the current state of students' access to digitized services in relation to provision of services in Puntland State University in Puntland, Somalia?

iii. What level has digitalization transformed service delivery in Puntland State University in Puntland, Somalia?

iv. Which strategies have been taken to address the challenges encountered in implementing digitalization for service delivery in public universities in Puntland, Somalia?

1.6 Significance of the Study

The research provided valuable insights to educational planners and university administrators, highlighting the critical role of digitalization in delivering educational services. It showed how digital tools can support continuous skill development, broaden the market for university courses, and further the university's mission of fostering knowledge and skills. This insight led to the development of actionable strategies to enhance access to training across various programs.

The aim of this research was to evaluate the current level of digitalization in order to identify efficient approaches for improving course delivery in Somalia's public universities via digital learning. The study also examined the financial costs associated with implementing e-governance programs, offering a thorough overview of the economic aspects. Additionally, it significantly improved the understanding of e-learning in course delivery. This research serves as a vital resource for stakeholders in higher education, providing insights and recommendations for future initiatives to leverage digital technologies.

The results of the study could reveal potential for cooperation among universities within the country and the broader region to develop and implement digital initiatives aimed at enhancing service delivery in higher education institutions. The findings offered important insights into key elements of service provision for higher education students and the broader public, enriching policy debates on issues like access, equity, and quality. These insights are crucial for policymakers as they make informed decisions in these domains.

The study could enable other researchers to uncover overlooked issues in service delivery that were not addressed in this research. Filling these gaps is essential for

carrying out comprehensive studies and devising solutions to the challenges of digitalization. As a result, higher education service providers could implement these solutions to enhance the quality of their services.

1.7 Scope of the Study

This research aimed to evaluate the relationship between digitalization and the efficiency of public service delivery in public universities, with a focus on Puntland State University in Puntland, Somalia. It examined the diffusion of innovation theory and the theory of reasoned action, assessed the current state of digital program resources, and analyzed students' access to these services. The study also explored how digitalization has transformed service delivery and identified strategies to overcome implementation challenges in Puntland's public universities. The research was conducted from June 1st to October 31st, 2023.

1.8 Limitations of the study

The generalizability of this study is constrained by its focus on a single case study within a specific context. The findings might not apply to other public sector organizations in Puntland, Somalia, or to other developing countries facing similar challenges. Moreover, the study relied on a sample of key stakeholders in the education sector, potentially neglecting the viewpoints of other stakeholders impacted by digital transformation in public service delivery.

The study utilized self-reported questionnaires, which could be subject to bias or inaccuracies due to participants' willingness to provide honest and precise responses. The research was conducted over a limited three-month period, creating a time constraint. Furthermore, infrastructure limitations in Puntland, Somalia, may

have affected the availability and reliability of digital technologies, influencing the adoption and impact of digital transformation on public service delivery efficiency.

1.9 Delimitations of the study

The research focused on the resources used in the digitalization program for effective service delivery, students' access to digital services, the impact of digitalization on service delivery, and the challenges faced by public universities in Puntland, Somalia. The study specifically targeted digital officers, department heads (service providers), and students (service consumers). Using a case study approach, it concentrated solely on public universities in Puntland, Somalia, excluding other public universities outside this region.

1.10 Assumptions of the Study

i. The Ministry of Education in Puntland, Somalia has adopted digital technologies on public service delivery in Puntland State University.
ii. The interested parties who participate the study offered truthful and precise answers to the questionnaires.
iii. The records and literature reviewed for the study are reliable and accurate.
iv. The data collected for the research was valid and reliable.
v. The recommendations provided by the study was feasible and effective in improving public service delivery in the Ministry of Education in Puntland, Somalia.

1.11 Operational Definition of key Terms

Digital Transformation: The adoption and integration of digital technologies (e.g., software, hardware, networks, and data) into an organization's processes, systems, and culture to enhance performance and achieve strategic objectives.

Public Service Delivery: The provision of government services to meet the needs and expectations of citizens and businesses, including education, healthcare, transportation, social services, and other public services.

Efficiency: The ability to complete a task or achieve a goal using the least amount of resources, time, and effort possible.

E-Governance: The use of information and communication technology (ICT) to facilitate service provision, information sharing, communication transactions, and system integration through e-governance.

E-Service: A broad term that encompasses various services provided online via the internet. Public universities: Educational institutions that receive government financial support for their daily operations and activities.

Transformation: The shift from a traditional or conventional approach to a more advanced and efficient method, specifically through digital transformation.

Effectiveness: The capability to achieve the desired results or outcomes of a task, program, or policy.

Quality: The degree to which a service meets or exceeds the expectations or needs of its users or stakeholders, including aspects like reliability, responsiveness, accessibility, and safety.

Key Digital Technologies: The specific digital technologies (such as cloud computing, mobile applications, data analytics, and social media) used by the Ministry of Education in Puntland, Somalia, to deliver public services.

Digitalization: The use of technologies that provide access to information and data through communication channels.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section, the text delves into multiple important topics. Initially, the theoretical basis of the study is outlined by the researcher, setting the stage for further analysis. Subsequently, the concept of digitalization is scrutinized, with a discussion on its definition and its repercussions within the realm of service provision. Lastly, the researcher evaluates how digitalization has revolutionized service delivery, emphasizing its effects in public universities.

The researcher also investigated the accessibility and equity of digital services at public universities, analyzing how digitalization affects the availability and fair distribution of these services. Additionally, the study evaluated the resources used in digital programs at public universities, with a focus on the tools and infrastructure involved. Additionally, the researcher explored the challenges of digitalization in public universities, specifically concerning service delivery. This involved analyzing the obstacles and difficulties faced and evaluating their impact on the success of digitalization efforts. The chapter concluded by summarizing the findings, identifying gaps in the current research, and highlighting areas that need further study and investigation.

2.1 Theoretical Framework

Theories provide a vital foundation for research, offering a framework that situates a specific study within the larger context of related topics and research themes. Theoretical frameworks are essential as they establish the boundaries and guidelines for the study. In this case, the research was based on the diffusion of innovation

theory and the theory of reasoned action, which formed the theoretical basis for the study.

2.1.1 Diffusion of Innovation Theory

Chen, Gillenson, and Sherrell (2020) contend that this theory effectively predicts both the likelihood and extent of new innovation adoption. It highlights five crucial attributes of innovation: compatibility, relative advantage, complexity, trialability, and observability. The attribute of relative advantage refers to the perceived superiority of an innovation over the existing idea or practice it replaces, significantly influencing its adoption.

Compatibility, in contrast, refers to how well an innovation aligns with the experiences, values, and needs of its potential adopters. Complexity describes the perceived difficulty or effort required to adopt innovations and their usability for end-users. Trialability, meanwhile, is the degree to which an innovation can be experimented with on a limited basis. Observability concerns the extent to which the effects or results of an innovation are visible to others (Lee, Hsieh & Hsu, 2017). These ideas commonly explain the ways in which end-users embrace new technologies and decide on their adoption.

Catalini and Tucker (2016) highlight the vital role of early technology adopters in the dissemination of new innovations. Their choices to adopt or reject a technology greatly influence its broader acceptance. For instance, blockchain technology has grown from a niche innovation to a widely acknowledged and secure platform, with various industries now exploring its use to enhance system security. This theory aims to explain the decision-making process in adopting new technologies, the factors affecting the adoption rate, and the different categories of adopters.

2.1.2 Theory of Reasoned Action

The Theory of Reasoned Action (TRA), based in social psychology, posits that behavior adoption is driven by the intention to perform that behavior, which is influenced by one's attitudes toward the behavior and subjective norms (Fishbein & Ajzen, 2015). Ajzen and Fishbein (2019) emphasize that analyzing beliefs and attitudes both before and after technology adoption provides valuable insights for addressing issues and shaping public policy. This theory can be applied to encourage the adoption of fourth industrial revolution technologies, significantly enhancing service delivery in public universities in Puntland, Somalia.

2.2 Empirical Review

2.2.1 Digitization in Universities

The University initially implemented online services for admissions, exams, and related activities. As part of e-Governance initiatives, information centers were set up in all government-affiliated colleges. These centers facilitate data transfer via an electronic system across the University's Wide Area Network, primarily serving as e-service delivery centers to provide online services to students locally. They also help colleges by digitizing data at the source, enhancing the efficiency and accessibility of information.

The University has internally developed and implemented comprehensive e-Governance solutions through a dedicated team of skilled engineers. To ensure these solutions meet high-quality, international standards, the University has collaborated with multinational corporations for consultancy and partnership. This strategy has allowed the University to cultivate its own e-Governance expertise. The e-Governance services created and implemented by the University generate

substantial revenue, supporting various budgetary needs, including staff salaries and the enhancement and maintenance of IT infrastructure. Revenue sources include fees from IT services, consultancy fees, and training program proceeds.

Numerous studies have examined the deployment and use of Information and Communication Technologies (ICT) in various sectors of higher education. These studies indicate that academic leaders extensively utilize technology for planning, oversight, monitoring, and assessing academic matters, student services, financial operations, and administrative tasks. The research underscores that integrating computing and communication technologies significantly boosts the overall academic effectiveness of faculty, students, and staff, enhancing their scientific knowledge and skills.

A 2015 study by Ashish Kumar and Arun Kumar emphasized the crucial role of Information and Communication Technology (ICT) as a contemporary management tool, highlighting its potential benefits for higher education institutions in India. Likewise, Gumala Suri's 2015 research examined the rapid changes occurring in universities in Spain and India, driven by advancements in ICT. The author recognizes user satisfaction as a key measure of success in digital transformation initiatives. Furthermore, the writer introduces a theoretical framework for establishing an effective technical infrastructure. By focusing on the incorporation of digital technology within university administration, the author underscores its importance in improving the strategic frameworks and processes of higher education institutions. This digital integration has resulted in substantial and progressive changes in higher education, facilitating the development of bigger, more sophisticated institutions that are more efficient and user-centric.

Moreover, the application of digital technologies in the management of higher education includes utilizing these tools to improve planning, establish standards, support organizational transformation, and track the results of essential university operations. There is widespread agreement on the importance of incorporating Information and Communication Technologies (ICTs) in higher education, as noted by UNESCO in 2019. Olive Mugenda (2016) stressed that digitalization is essential because it removes physical constraints on content, facilitating the dissemination of information and knowledge. This process enables the continuous exchange of information beyond geographical boundaries, linking remote communities through global networks. Ultimately, this accessibility ensures that information, knowledge, and culture are available to everyone.

The OECD (2017) states that digitalization in education primarily handles the management of student and employee records, communication, and document handling. Ashish Kumar and Arun Kumar (2015) highlight the favorable views towards using Information and Communication Technologies (ICT) in education, with students from different universities reporting the use of digital tools for communication and participation in online forums. Digitalization has improved communication and information exchange while expanding access to higher education. It includes systems for student admissions, record-keeping, examination results, academic records, financial databases, human resources databases, and management information systems. Research shows that in educational settings, information management involves handling daily operational activities. The information administration cycle is centered around four main elements, focusing on student administration, staff administration, and general administration. A

conceptual model has been created to visually depict the structure of information management, as shown below:

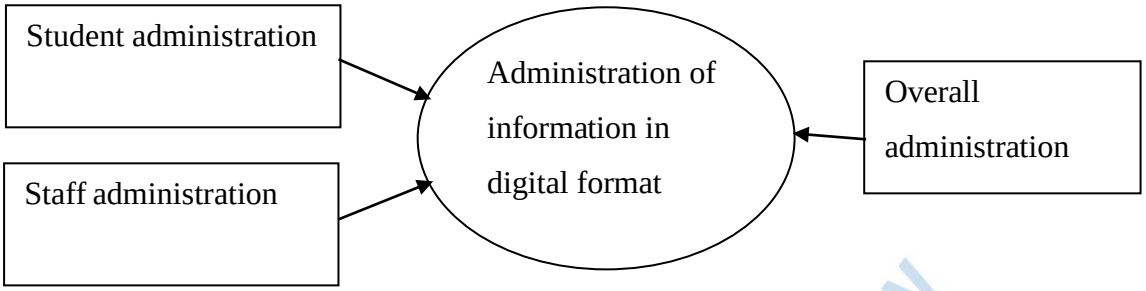

Figure 1: Theoretical Model for Information

Administration Source: Researcher (2023)

Within this framework, information administration encompasses the managerial duties associated with higher education institutions, often termed as managerial activities in pertinent research. Maki (2018) explains that these administrative functions span several domains such as managing personnel, students, resources, finances, and general administration. Reviews of the literature suggest that in the routine operations of higher education institutions, three key functional areas of information administration are pivotal: management of students, personnel, and overarching administration.

Student administration plays a vital role in information management, covering various aspects ranging from the admission process and educational activities to result processing and performance analysis. Thomas Kwaku Obeng (2014) notes that integrating Information and Communication Technology (ICT) into admission procedures in higher education institutions enhances accessibility, allowing for broader participation.

The literature review focuses on the crucial elements of digitizing the admission process through electronic media. This encompasses various activities such as students making inquiries about admissions, submitting applications via digital platforms, and using computers for registration and enrollment purposes. Additionally, it involves accessing academic resources like timetables and class schedules online. The use of electronic media simplifies the tasks of monitoring and managing student attendance. Moreover, the adoption of technology in the admission process enhances communication regarding transportation, hostel accommodations, and interactions with parents or guardians. This technological integration also expands the geographical reach for student admissions, thus promoting cross-border opportunities in higher education.

Personnel management involves tasks such as recruiting faculty and staff, assigning duties, tracking their attendance and leave, and performing evaluations of their work. It also includes promoting communication within the institution and among peers. The use of Information and Communication Technology (ICT) in managing staff affairs allows for efficient management of extensive records with speed, precision, and smooth integration. This technology improves the ease of accessing data, a point highlighted by Thomas Kwaku Obeng in 2014.

Effective administration heavily relies on a robust communication system, which is significantly enhanced by digitalization within higher education, as noted by Magni in 2019. Digitalization enables rapid information sharing among all relevant stakeholders. Communication serves both internal and external functions, encompassing the collection and dissemination of information. It facilitates interactions among essential stakeholders by distributing electronic notices to

students, faculty, and staff. Additionally, the dissemination of institutional information through electronic kiosks plays a significant role. In this study, communication elements are fundamentally incorporated into both student and staff administration.

Effective information management in higher education institutions is deeply intertwined with general administration, which includes a range of daily activities within the institution. Extensive literature reviews, such as those by Hasan et al. in 2017, show that integrating digitalization into these administrative processes has led to improved efficiency and better use of resources. This comprehensive category includes various functions, such as using electronic media to organize venues and resources, simplify the payment of fees, and coordinate examination activities both internally and externally with faculty. It also involves managing day-to-day operations and improving communications among different groups. Given your background in evaluating digitalization in public service delivery, these aspects might resonate with the efficiency improvements you've studied in university administrative systems.

2.2.2 Status of Resources Used in Digital Program of Service Delivery in Public Universities

Fair-weather (2016) notes a prevalent belief that faculty members may occasionally impede the integration of digital technologies in higher education, which could diminish their efficacy in delivering services. However, research suggests that incorporating digitalization within university education can significantly contribute to national development. The goal of this strategy is to improve the quality of higher education and expand its reach, thereby enhancing and enlarging educational programs on a wider scale.

In their research, Bhattacharya, Gulli, and Gupta (2015) presented seven distinct criteria for evaluating the quality of electronic services on government websites. These criteria provide crucial information for developers, helping them understand user requirements and improve the design and functionality of online services. However, like many other studies, this research does not offer a detailed explanation or justification for choosing these particular dimensions of service quality.

Tat-Kei Ho (2016) argues that the e-government model shifts the focus of public managers from primarily considering producer-oriented concerns like cost-efficiency to prioritizing user satisfaction, control, flexible service delivery, and effective management of networks that include both internal and external stakeholders. This shift underscores the importance of innovation, organizational learning, and entrepreneurship in consistently improving and advancing institutional operations. Additionally, Naz (2019) studied the connection between e-governance and service performance outcomes, such as effectiveness, efficiency, and equity. The findings reveal that e-governance in public service delivery can exceed citizen expectations, successfully attaining the primary public management objectives of effectiveness, efficiency, and equity.

Ajayi (2018) notes that the efficient utilization of digital technologies in information services has made it easier to manage high enrollment numbers in many public universities. This advancement offers new opportunities for rapid communication and worldwide information access. As digital technology becomes more prevalent across different sectors, it increasingly allows people globally to access information resources from anywhere in the world.

Gronroos (2017) categorizes customer services into two types: high-touch and high-tech services. High-touch services emphasize personal interactions, while high-tech services rely on automated technologies. It's essential to recognize that high-touch services combine physical resources with technological systems, necessitating effective management and seamless integration to meet customer needs. Consequently, electronic services blend advanced technology with personalized interaction. For example, high-tech services include online payments, mobile billing, and ATMs, while high-touch elements involve providing guidance and personal assistance to customers using these technologies. This study aimed to investigate the use of resources in the digital service delivery program at Puntland State University in Puntland, Somalia.

2.2.3 Access to E-Governance in Provision of Service in Public Universities

Ray and Dash (2015) identify the primary stakeholders in e-governance as the government, investors, employees, vendors, intermediaries, and citizens. They stress that the success of e-governance is influenced by external environmental factors such as social, political, legal, and economic conditions. Additionally, internal factors are crucial, especially the use of digital applications to enhance the efficiency and effectiveness of internal operations, communication, and connectivity.

According to GOMP (2017), the government's primary goal in the digital sector is to improve the quality of life for citizens through the implementation of e-governance. This includes drawing investments that enable educated young people to contribute to state development, fostering a workforce skilled enough to compete nationally, and transitioning from a resource-based to a knowledge and intellectual asset-driven economy. Regardless of whether a company focuses on products or services,

maintaining high service quality is essential for sustained success and standout performance. Parasuraman and Grewal (2020) explain that service quality is more difficult for competitors to replicate than product quality and pricing, which underscores its importance.

Research by Ozioko (2018) and Nwachukwu (2015) suggests that users of digital services should have ICT skills to effectively and efficiently access information. Digital facilities are crucial for information service delivery as they enable institutions to provide clear demonstrations and cater to the diverse needs of a large user base. Chisenga's (2017) research in Zambia showed that libraries effectively using digital resources can provide global access to extensive information resources, fulfilling user needs. Lau (2018) underscored the significance of possessing ICT access and a workforce proficient in learning within the realm of e-governance. Furthermore, leadership, regulatory frameworks, financial resources, organizational conditions, and IT infrastructure are essential factors to consider. This study aimed to assess the accessibility of service delivery through digital platforms at Puntland State University in Puntland, Somalia.

2.2.4 Extend to which digitalization Transforms Service Delivery

Several scholars (Adeboye, 2015; Herman, 2016; Heeks, 2020; Holzer, 2014; Kenny, 2019; Welch E.W, 2015) have identified the main objectives of e-government as increasing public information availability, improving access to public services, reducing costs, and boosting efficiency. Kashorda (2009) noted that the Somali government has made efforts to expand computer access in all its ministries. However, Thompson (2019) contends that simply having computers does not ensure positive

outcomes. Simplifying regulations and procedures through computerization can lead to shorter waiting times and enhanced service quality.

Furthermore, digitization not only diminishes paperwork but also enhances communication and cooperation, resulting in reduced bureaucracy and corruption. Consequently, this transformation allows for the provision of better services at lower costs, as noted by NASSCOM in 2003. For instance, numerous public agencies are working to cut administrative costs to ease business operations, meet legal requirements, and leverage the widespread use of information technology. Irani Z., Elliman, T., and Jackson, P. (2017) describe this push towards digital adoption in government as "Transformational Government," a movement aimed at accelerating the benefits of digitalization and acting as a catalyst for change.

Kraemer and King (2015) contend that rather than transforming the institutional framework of public administration, information technology (IT) tends to reinforce existing structures. To truly maximize the benefits of e-government, broad changes are needed beyond merely adopting digital tools. Peristeras & Tarabanis (2020) stress the importance of government organizations embracing a customer-centric approach. Additionally, Dhillon, G. S., Weerakkody, V., and Dwivedi, Y.K. (2018) argue that a comprehensive transformation should extend to back-office processes, not just front-office service delivery. Castells (2020) and Bannister (2015) suggest that achieving these goals requires moving away from traditional hierarchical structures characterized by isolated IT tasks, towards a more integrated approach where tasks are part of cohesive processes.

Nwachukwu (2015) emphasizes in his study on the use of information technology in libraries in developing countries that digital libraries significantly enhance the

utilization of organizational resources. This leads to increased user satisfaction, cost-effectiveness, better integration, and improved service orientation. Similarly, Iya (2018) in his research on the impact of internet resources on research productivity at Nigerian universities, notes that digitalization in reference services has expanded the range of accessible information sources. Libraries and information centers have adopted various communication channels such as databases, the internet, online library services, emails, faxes, videotapes, CDs, and diskettes, providing multiple ways to address user inquiries. Research by the Commonwealth Telecommunications Organization (CTO) in Ghana, India, and South Africa found that the adoption of services through digital platforms is influenced by both demand and supply factors.

The study highlighted that in South Africa, the main obstacle to the adoption of e-services was cost, while a perceived lack of necessity for the services was deemed the least influential factor. In contrast, in Ghana, the primary reason for not using e-services was the perception that they were unnecessary, and issues related to local language usage were seen as the least significant factor (CTO, 2017).

Schuppan (2018) discusses the importance of considering the unique institutional and cultural contexts in sub-Saharan Africa when implementing digital services within organizations. The study underscores that realizing the full potential of web-based services necessitates addressing key prerequisites during the rollout process. Due to the particular institutional conditions in Africa, longer preparation times and project durations are often necessary compared to those in developed countries. The article stresses the need to account for varied administrative environments and rationalities in order to successfully implement digital initiatives.

Institutions and organizations in Somalia have seen significant improvements in connectivity and possess a robust pool of human resources to aid digitalization initiatives. Despite these advancements, there is still a limited understanding of how digital usage impacts service implementation in public universities. As a result, this study aims to evaluate the degree to which digital initiatives have revolutionized service provision in Puntland, Somalia.

2.2.5 Challenges of digitalization in Public Universities and their Mitigations

Chadwick's (2019) research suggests that the websites of institutions in the United States, Great Britain, and the European Union often lack interactivity and features conducive to deliberation. As a result, Chadwick concludes that it is unlikely for these e-institutions to lead to significant changes in governance. Likewise, Moon (2016) contrasts e-government initiatives and results in U.S. institutions and discovers that despite the extensive integration of digital technologies, numerous websites are still in nascent stages of development and fail to meet anticipated outcomes.

Mishra (2014) emphasized the importance of creating a detailed strategy to tackle challenges by fostering a digital culture in higher education. He suggested formulating a practical action plan aimed at boosting the performance of India's higher education sector. The significance of digitalization in universities is growing, driven by increasing student enrollments and the need for efficient financial management and planning.

Dhakal and Jamil (2020) carried out a study to explore the obstacles linked to digitalization and how it influences service delivery in Nepal. The data analysis revealed that most respondents noted significant enhancements in timely access to

information (70%), easier complaint filing (59%), and receiving services within the expected time (52%). Despite these improvements, more than half of the respondents indicated a need for better service reporting. The researchers concluded that while digitalization has noticeably improved service delivery, there remains a common view that there is a skill gap in using digital technologies to further improve service delivery.

Challenges to the effective implementation and use of digital solutions in universities are often referred to as failure factors. Ndou (2014) describes these as potential impediments or obstacles. Key barriers to successful digital integration include factors such as the state of infrastructure, financial limitations, insufficient data systems and compatibility issues, a lack of skills among staff, specific leadership styles, cultural factors, bureaucratic hurdles, and attitudes of users. Bhatnagar (2018) highlights the importance of ensuring that all the success factors are in place and avoiding these failure factors to fully benefit from digital initiatives. While previous studies have extensively explored the numerous challenges linked to digitalization in service delivery, it's important to acknowledge that these challenges can differ based on the particular context and environment where the service is delivered. The primary goal of this study was to identify and examine the unique challenges of digitalization within Puntland State University in Puntland, Somalia. By concentrating on a specific institution and its geographic context, the study sought to deepen the understanding of the particular obstacles Puntland State University faces in its digitalization efforts. This targeted approach enabled a detailed exploration of the factors that may influence the successful adoption of digital initiatives at the university.

Addressing the challenges of digitalization in service delivery is crucial for Puntland State University to enhance operational efficiency, improve service quality, and meet the evolving needs of its students, faculty, and staff. This study aimed to identify and analyze specific barriers that might hinder the successful adoption and use of digital technologies within the university. The findings will provide valuable insights for decision-makers, administrators, and stakeholders at Puntland State University, helping them pinpoint key areas requiring attention and intervention. This information will help in creating customized strategies and action plans that are aligned with the university's unique context, thereby supporting the effective advancement of digital projects.

Additionally, the study emphasizes the importance of context-specific research for understanding the challenges and opportunities associated with digitalization in service delivery. Strategies that are effective in one setting may not necessarily yield the same results in another due to varying contextual factors. Hence, this research offers critical insights that could shape future research efforts and aid in developing best practices for digitalization within the higher education sector in Puntland, Somalia.

In summary, this research aimed to identify and analyze the challenges Puntland State University faces in its digitalization efforts. By understanding these challenges, the university can make informed decisions and develop strategies to overcome obstacles, improve service delivery, and optimize digital technology use. The findings contribute to the existing knowledge on digitalization in service delivery and offer important insights specific to higher education in Puntland, Somalia.

2.2.6 Approaches for optimizing digital utilization in the delivery of services in Public Universities

To connect campus departments to the external world via the internet, it is recommended to implement advanced technologies like optical fiber cabling and Wi-Fi. Despite the growing digital access disparities, the current digital policy lacks a strategy to ensure inclusivity and equal opportunities for everyone, as highlighted by the United Nations in 2020. Moreover, introducing an information system for various university operations would necessitate a significant overhaul of existing procedures. With resource and funding constraints, the task of digitizing universities presents additional challenges.

Kandiri (2016) highlights the necessity for a supportive digital policy framework and strong leadership at senior levels to successfully address the challenges of digitalization. Nonetheless, a digital divide complicates the involvement of a broader array of stakeholders, especially students. Universities in India encounter additional hurdles in implementing E-Governance, including poor infrastructure, a lack of local expertise, cumbersome bureaucratic procedures, and insufficient legal frameworks. Kandiri (2016) also notes that although resistance to technology remains a significant barrier, there is little evidence that universities have effectively raised awareness among their staff and students about the benefits of digitalization in improving service delivery.

Bhatnagar (2018) recommends that to fully capitalize on digitalization, it is crucial to establish all the necessary success factors and deliberately avoid any aspects that might cause failure. However, achieving this ideal situation is typically challenging in reality, highlighting the importance of taking proactive steps to improve success

rates. Settles (2015) highlights that adopting digital solutions necessitates the development of new managerial and technical skills. These competencies are crucial for the planning, assessment, management, financing, and integration of information systems within government structures.

Ekweme (2018) recommended integrating a variety of digital technologies in academic libraries, including telephone systems, fiber optics, satellite connections, and various types of office equipment, to improve service delivery. On the other hand, Adegboyega, Tomasz, Elsa, and Irshad (2017) highlighted the importance of digital skills as essential for successful digitalization. These skills, ranging from basic digital literacy for all employees to advanced technical expertise for specialists, are critical for effective information management and seamless service delivery. They include strategic planning, system development, implementation, maintenance, and user support.

Nworgu (2016) called for a revamp of the national information technology policy, emphasizing the need for effective alignment of various digital policies and programs. Longshak, Daze, and Duse (2018) recommended nationwide collaboration among education, information science and technology ministries, state library boards, and regulatory bodies for special and research libraries. They proposed digitizing, networking, creating, and hosting websites for these libraries to create a crucial platform for accessing information resources, benefiting academic and research institutions and contributing to national development. Okore (2015) highlighted the importance of developing a digitally skilled workforce in libraries, building strong ICT infrastructures, securing adequate government funding, and effectively implementing

the national information technology policy to enhance service delivery through digital libraries.

Zeugwu (2016) suggested initiating orientation programs, workshops, seminars, and conferences to facilitate knowledge exchange between experienced service providers and newcomers. This approach aims to promote mutual understanding between traditional service providers and digital experts. Meanwhile, Jibril (2019) emphasized the importance of government-mandated digital training at all educational levels. Jibril (2019) argued that digitalization is essential for survival in the modern world and acts as a foundation for any nation's progress. This goal should be pursued by enforcing digitalization not only in teaching and learning but also in managing education and governance. Additionally, the current study explores various strategies to address the challenges associated with digital-based e-governance in public universities.

2.3 Conceptual Framework

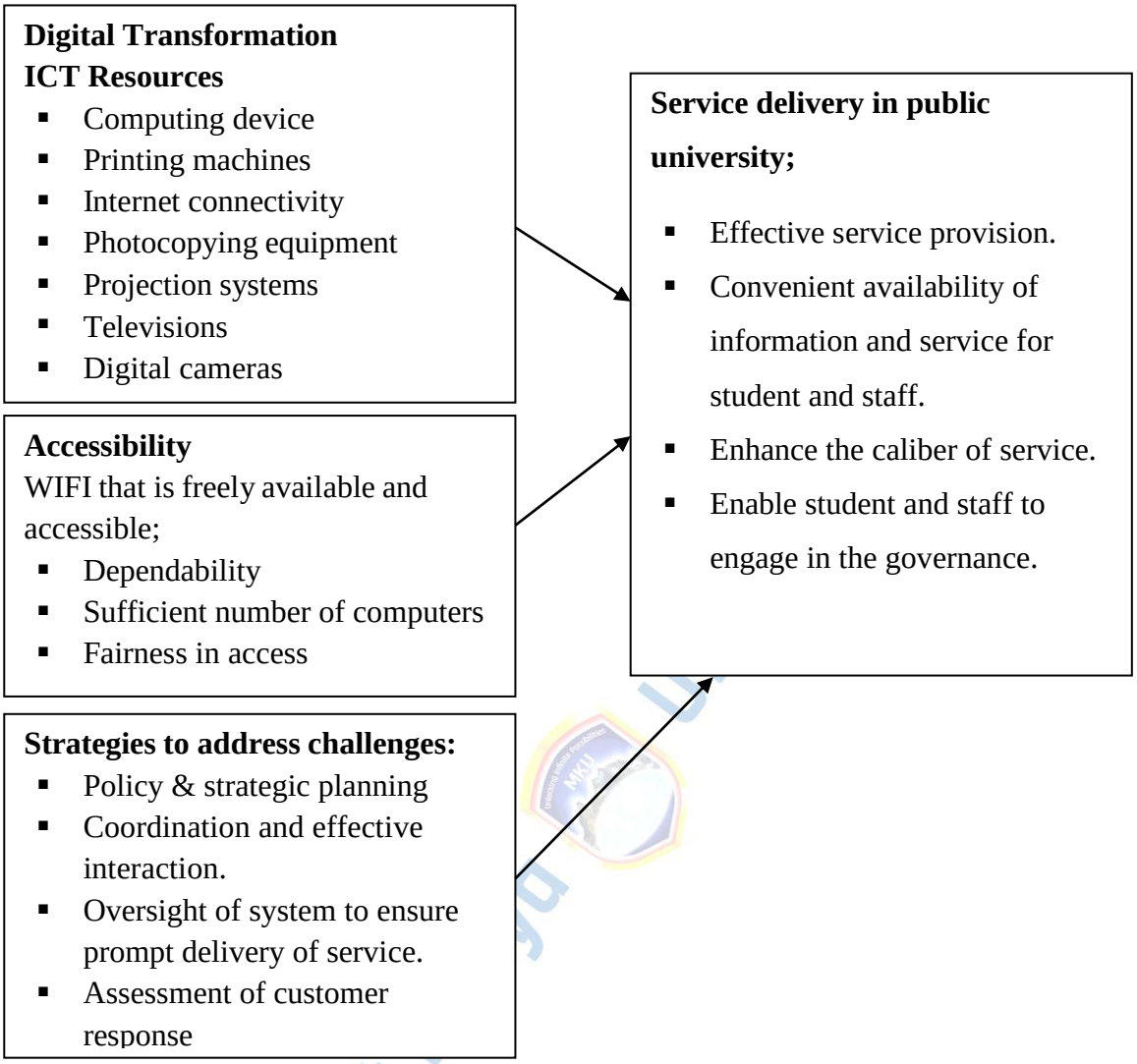

Figure 2: Conceptual Framework

Source: Researcher (2023)

Digitalization involves transforming government data into an electronic format for distribution from the central authorities to local individuals. This approach leverages technologies like the internet, web networks, digital communication, and telecommunications infrastructure. The implementation encourages a smooth electronic transactional relationship between higher authorities and citizens. The use of the internet, digital tools, and contemporary technology is crucial for

conducting government operations. In Bangladesh, the education sector is particularly significant, though it is often managed by traditional processes. The main aim of this research was to explore the role of digitalization in enhancing the efficiency and effectiveness of the education system, particularly within the Sylhet Education Board. The study will organize the independent variables into three key categories: availability of digital tools, accessibility, and institutional obstacles. Digital tools include various resources like computers, internet access, printers, photocopiers, and projectors, along with their associated services. The evaluation of accessibility will examine how user-friendly and reliable these digital tools are, their adequacy, and the ease of access to them. The primary obstacles to be addressed will involve challenges related to digital literacy and institutional issues.

The research will assess several dependent variables linked to various outcomes. The objectives include improving the efficiency of service delivery in public universities, facilitating easy access to information and services for students and staff, and enhancing the quality of the services offered. Additionally, the study aims to boost student and staff participation in university governance and ensure that the management of public universities is accountable, responsive, and transparent.

Numerous elements influence the effectiveness and efficiency of the management system within the Education Board and the wider educational framework. Digitalization, an ongoing and progressive endeavor, seeks to boost efficiency and effectiveness through the incorporation of contemporary technologies like the internet, closed-circuit cameras, and digital telecommunications into everyday activities. With the adoption of appropriate and impactful technologies, the education sector can thoroughly implement digitalization. This involves securely

storing data of students, lecturers, and staff in computer databases, potentially using data disks. Computers and the internet can streamline processes like result processing, examination management, and admissions. Furthermore, it is crucial for staff in the education sector to undergo thorough digital training and possess a strong grasp of digitalization principles.

Implementing a Management Information System (MIS) can significantly boost digitalization efforts. This system supports enhanced management through the use of digital tools like CC-Cameras for monitoring and web networking for information sharing. Additionally, accounting software optimizes financial management by automating transactions and budget tracking. Integrating these technologies within an MIS framework is key to improving the efficiency and effectiveness of management processes.

2.4 Recap of Literature Review

The literature review relied on various documentary sources, including textbooks, journals, conference proceedings, and seminar papers, available in both print and electronic formats. Much of the referenced material was from Nigeria. This review provided essential insights, helping the researcher understand the topic more comprehensively. It highlighted the necessity of accessible digital resources for universities to deliver information services effectively in the digital era and noted that service delivery often faces challenges due to issues with the availability and efficient use of these resources. Despite numerous studies on digitalization in higher education, research specifically on Puntland State University in Puntland, Somalia, is scarce. This underscores the importance and urgency of the researcher's

investigation into the relationship between digitalization and public service delivery at this university.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter offers a detailed description of the research design, including the study's location, the target demographic, the process for selecting samples, the research instruments employed, the pilot phase, the procedure for collecting data, the analysis techniques used, and how the findings were communicated.

3.1 Research Design

This study utilized a descriptive survey research design, a method frequently employed in social science to thoroughly investigate social behaviors or contemporary phenomena within their real-life settings. The survey offered a detailed overview of the state of digitalization and examined the challenges involved in managing such an institution.

Yin (2015) recommended the use of a case study methodology as it enables researchers to explore in-depth and meaningful facets of real-life events. This approach focuses on detailed analysis over generalizability, concentrating on a few events and their interconnectedness. As this study focused on a single organization, the case study design was deemed the most suitable method to employ.

3.2 Target Population

Mugenda and Mugenda (2016) describe the intended population for a study as those who are expected to be at the heart of the research focus. In this study, the target population comprised 61,496 third-year students from Puntland State University in Puntland, Somalia, along with 10 department heads from a total of 14 departments, and 5 members of the digital staff.

3.3 Sampling Procedure and Sample Size

As stated by Mugenda and Mugenda (2016), sampling involves selecting a subset of individuals from a larger population to serve as representatives for the entire group in a study. To determine the appropriate sample size for this research, the formula recommended by Mugenda and Mugenda (2016) was be applied. Using this formula, the sample size is calculated to be 196 participants.

$$n = \frac{Z^2pq}{12}$$

Where: n = the desired sample size for populations over 10,000, Q = 1-p, and d = the level of statistical significance, which in this case was 95%. The formula used was n = [(1.96)^2 (0.85) (0.15)] / (0.05)^2 = 196. A random sampling method was employed to select a representative sample of 196 third-year students from Puntland State University in Puntland, Somalia. Additionally, 10 department heads were intentionally selected, including five from the digital department. The findings from this study can be generalized, as the sample size of 196 conformed to normal distribution and standard statistical procedures. This approach was consistent with the recommendations of scholars such as Mugenda and Mugenda (2016) and other researchers in the field.

Table 1: Sample Size

Population	**n**	**N**
IT officers	5	10
Students	196{$n = \frac{Z^2pq}{12}$}	61496
Head of departments	10	14
Total Population	**221**	**61510**

Source: Source: Researcher 2023

3.4 Research Instruments

For this research, the investigator utilized questionnaires to gather data from department heads and digital officers at Puntland State University in Puntland, Somalia.

3.4.1 Questionnaire

Orodho (2018) noted that questionnaires are particularly effective for uncovering insights about individuals' thoughts, attitudes, perceptions, and emotions that might not be easily accessible otherwise. In this study, questionnaires were used to gather data from students, department heads, and digital officers at Puntland State University in Puntland, Somalia. The questions covered accessibility and fairness, the state of e-resources, challenges faced, and strategies to overcome these challenges. The researcher used various question types, including closed-ended, open-ended, contingency, and Likert-scale questions. Open-ended questions allowed respondents to express personal opinions, while closed-ended questions provided multiple-choice options.

3.4.2 Piloting

Pilot testing involved an initial trial of the research procedures and instruments to identify and correct issues like unclear instructions or ambiguous questions, preventing costly mistakes. This crucial step ensured potential problems were addressed before the main study. In this study, a preliminary test assessed the validity and reliability of the research instruments. Questionnaires were administered to a randomly selected group of 21 students and one department head not involved in the main study. The procedure was repeated after two weeks to further evaluate the instruments' validity and reliability.

3.5 Validity

Wiersman (2015) described validity as the degree to which an instrument accurately measures the intended construct or phenomenon. To ensure the study's validity, the researcher took several steps. First, the instrument was crafted to be clear, understandable, and logically organized, thereby enhancing its face validity. Additionally, the researcher consistently observed the same variables among all participants in the selected group. Finally, the instrument's content was reviewed and validated by the researcher's supervisor to ensure it aligned with the study's objectives, thereby confirming its content validity.

3.6 Reliability

Mugenda and Mugenda (2016) defined reliability as the degree to which a research instrument consistently yields the same results or data across repeated trials, noting that random error can impact reliability, with higher levels of random error leading to lower reliability. In this study, the test-retest method was used to evaluate the reliability of the instruments. The research instruments were initially administered to a group of participants during the pilot study at the selected institution, and their responses were recorded. After a two-week interval, the same instruments were given to the same group again, and the results from both administrations were compared for consistency. The correlation between the scores from the two testing periods was determined, and a reliability index was calculated using a coefficient level of 0.70. A significance level of above 0.7 indicated that the research tools were reliable, meeting the standards set by Creswell (2015).

3.7 Data Collection Procedure

Before starting the field study, the researcher obtained an approval letter from the graduate school of Mount Kenya University to authorize the data collection process. The researcher then visited the selected university and arranged meetings with the chosen respondents. During these meetings, the researcher employed the designed data collection methods to gather the necessary information. After collecting the data, the researcher proceeded to the analysis phase.

3.8 Data Analysis

The data gathered for this research was analyzed through content analysis, managed and processed using Excel software. The completed questionnaires were checked for completeness and consistency. The analysis involved qualitative methods, and the findings were compiled into a report. Additionally, quantitative analysis was conducted, specifically using descriptive statistics. Questionnaire responses were analyzed using SPSS version 20. Data organization and examination employed basic frequencies and percentages. Cross-tabulations explored digital resource adequacy, effectiveness, inefficiency, and absence. Descriptive statistics, including frequencies and percentages, summarized study results. Means and standard deviations assessed digitalization's impact on service delivery via the Likert scale. Analyzed data was presented through tables, graphs, plots, and prose, categorizing findings across various digitalization and public service delivery aspects.

3.9 Ethical Considerations

The survey responses underwent analysis utilizing SPSS version 20. Basic frequencies and percentages were used to organize and examine the data. Cross-tabulations investigated the sufficiency, efficacy, inefficiency, and absence of digital

resources. Descriptive statistics, such as frequencies and percentages, provided an overview of the study's outcomes. Means and standard deviations were computed to evaluate the influence of digitalization on service provision, employing the Likert scale. The findings were showcased via tables, graphs, plots, and textual summaries, categorizing insights related to digitalization and public service delivery.

The research study emphasized obtaining informed consent from participants and safeguarding the confidentiality of gathered data. Adhering to Kothari's (2015) recommendations, clear and comprehensive communication about the study's particulars with participants was crucial. The researcher acquired documented informed consent and enforced protocols to uphold anonymity and confidentiality. With the required authorizations and an introductory letter secured, the researchers then proceeded to select participants and arrange suitable times for distributing and collecting the self-administered questionnaires. These procedures ensured efficient and ethical data collection, adhering to the planned schedule and maintaining rigorous standards throughout the study.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The chapter centers on analyzing data, presenting results, and delving into the findings. The study aimed to evaluate the influence of digitalization on the effectiveness of public services at Puntland State University in Puntland, Somalia.

4.2 Pilot Test Results

This chapter outlines the outcomes, analysis, and discussion of the pilot study, which included 21 participants, constituting 10% of the overall sample. The data were analyzed using the Statistical Package for Social Sciences (SPSS) software. The reliability of the instruments was assessed using Cronbach's Alpha, and presented the results in Table 2.

Table 2: Reliability Test Results

Variable	N	Cronbach'sAlpha Value
Status of resources	21	.714
Accessibility to digitized services	21	.712
Extent of digitalization	21	.756
Challenges of digitization	21	.720
Service delivery	21	.715

Source: Field Data,2024

The questionnaires were inputted and then subjected to the Cronbach's Alpha Test. Each of the five variables exhibited Cronbach's Alpha values surpassing the 0.7 threshold, as displayed in Table 2. The pilot study yielded values of 0.714,

0.712, 0.756, 0.720, and 0.715 for resource status, access to digitized services, degree of digitalization, and service delivery at Puntland State University in Puntland, Somalia. All these variables demonstrated Cronbach's Alpha values greater than 0.7, affirming the reliability of the measurement instruments.

4.3 Response Rate

In this study, 221 questionnaires were distributed for data collection, and 198 of these were filled out correctly and returned. This led to an overall successful response rate of 89.5%. Respondents were assured that their information would remain confidential. As per Trex (2012), a response rate of 50% is considered acceptable. Hence, response rate of 89.5% was regarded appropriate for data analysis.

Table 3: Response Rate

Sampled respondents	Questionnaires Returned	Response Rate (%)
221	198	89.5

Source: Field Data,2024

4.4 Demographic Information

4.4.1 Gender of the Respondents

The researcher aimed to determine the gender distribution among the study participants. The outcomes are presented in Table 4.

Table 4: Respondents Gender

Gender	**Frequency**	**(%)**
Male	104	53
Female	94	47
Total	**198**	**100**

Source: Field Data,2024

The findings indicated that out of the total respondents, 94 (47%) were female, whereas 104 (53%) were male. This implies that most respondents, and presumably most students at Puntland State University in Puntland, Somalia, were male.

4.4.2 Level of education

The researcher aimed to ascertain the educational backgrounds of the study participants. The results are outlined in Table 5.

Table 5: Level of education

Certificate	**42**	**21**
Diploma	46	23
Bachelor Degree	80	41
Masters	24	12
PhD	6	3
Total	**198**	**100.0**

Source: Field Data,2024

The findings revealed that the largest group of respondents were bachelor's degree holders, accounting for 80 (41%) of the participants. This was followed by diploma holders at 46 (23%), and those with certificates at 42 (21%). Participants with master's degrees numbered 24 (12%), while PhD holders were the fewest at 6 (3%). The majority of respondents holding at least a bachelor's degree suggests that all participants were literate and capable of independently reading and responding to the questionnaires.

4.4.3 Period of Current Position

The researcher's objective was to establish the duration of time that respondents had occupied their current positions. The results are depicted in Table 6.

Table 6: Period in Current Position

Period in years	Frequency	Percentage (%)
1-5	105	53
6-10	45	23
11-15	30	15
Over 15	18	9
Total	**198**	**100.0**

Source: Field Data,2024

The data on the age of respondents indicated that the majority, n=105 (53%), had held their current positions for 1-5 years. Those who had been in their roles for 6-10 years accounted for n=45 (23%), while n=30 (15%) had been in their current positions for 11-15 years. A smaller group, n=15 (9%), had been in their positions for over 15 years. These findings suggest that most of the respondents had been in their current roles for 1-5 years, implying they possessed considerable experience with digitalization and public service delivery at Puntland State University in Puntland, Somalia.

4.5 Descriptive statistics for the study variables

4.5.1 Resources status of used in digitized programme on service delivery in Puntland State University in Puntland, Somalia.

4.5.2 Adequacy of computers in the University to serve the whole student's population

The study aimed to assess whether the University had a sufficient number of computers to accommodate the entire student population. The results are displayed in Table 7.

Table 7: Adequacy of computers in the University to serve the whole students' population

	Frequency	Percentage (%)
Yes	79	40
No	119	60
Total	**198**	**100**

Source: Field Data,2024

The research findings revealed that the majority of respondents, 119 (60%), reported that the computers at the university were insufficient to serve the student population. Conversely, a minority of respondents, 79 (40%), also noted a shortage of computers. This indicates a general inadequacy of computers at Puntland State University in Puntland, Somalia, to meet the needs of the student body.

4.5.3 Portals and websites usage in the population Puntland State University

The research aimed to assess the consensus regarding the utilization of portals and websites for different objectives at Puntland State University. The results are illustrated in Table 8.

Table 8: Level of agreement on the usage of portals and websites in Puntland State University

Extent	Frequency	Percentage (%)
Strongly agree	46	23
Agree	79	40
Neutral	29	15
Disagree	28	14
Strongly disagree	16	8
Total	**198**	**100.0**

Source: Field Data,2024

The research results regarding the consensus on utilizing portals and websites for diverse functions at Puntland State University indicated that most respondents, comprising 79 (40%), agreed with their usage. Subsequently, 46 (23%) expressed strong agreement. Neutral responses were provided by 29 (15%), while 28 (14%) disagreed, and a small minority of 16 (8%) strongly disagreed with the use of portals and websites. These findings imply an overall acceptance and utilization of portals and websites for various purposes at Puntland State University.

4.5.4 Portals and websites usage in the population Puntland State University

The research sought to assess the respondents' stance regarding the utilization of portals and websites for different purposes at Puntland State University. The specific findings are outlined in Table 9.

Table 9: Agreement on the usage of portals and websites in Puntland State University

Statement	Yes	No	Me	St d
The portals enable students to apply online for admission and accommodation	190 (96%)	8 (4%)	4.23	.706

The portals facilitate online application for student admission and accommodation.	108 (55%)	80(45%)	4.52	.719
Online financial services, such as university fee payments and inquiries, are provided through the portals.	168(85%)	30 15%)	4.68	.764
The portals enable students to register for units and participate in e- learning through	188(95%)	10(5%)	4.51	.745
The portals are designed to be user-friendly and easily accessible to both students and academic staff members.	170(86%)	28(14%)	4.76	.812
The portals experience high user engagement and provide prompt and efficient services to	195(98%)	3(25%)	4.67	.839
The portals enable students to register for units and participate in e- learning through	188(95%)	10(5%)	4.38	.798
The portals are designed to be user-friendly and easily accessible to both students and academic staff members.	170(86%)	28(14%)	4.21	.841
The portals experience high user engagement and provide prompt and efficient services to	195(98%)	3(25%)	4.76	.765

(Source field data,2024)

The study investigated the use of portals at Puntland State University for online applications for admission and accommodation. The findings revealed that a majority of respondents, 190 (96%), agreed with the portal's effectiveness, while 8 (4%) disagreed, resulting in a mean score of 4.23 and a standard deviation of 0.706.

Further analysis on the portal's facilitation of online applications for admission and accommodation showed that 108 (55%) agreed and 80 (45%) disagreed, with a mean of 4.52 and a standard deviation of 0.719.

Concerning online financial services like paying university fees and making inquiries via the portal, a substantial majority of 168 (85%) respondents favored their utilization, while 30 (15%) expressed disagreement, with an average score of 4.68 and a standard deviation of 0.764.

The study also indicated substantial agreement on the portals' capability to enable students to register for units and engage in e-learning, with 188 (95%) in favor and 10 (5%) against, achieving a mean of 4.51 and a standard deviation of 0.745.

Regarding the user-friendliness and accessibility of the portals for both students and academic staff, there was strong agreement, with n=170 (86%) in favor and n=28 (14%) against, featuring a mean of 4.76 and a standard deviation of 0.812.

Additionally, the findings showed high user engagement and efficient service delivery through the portals, with n=195 (98%) agreeing and n=3 (2%) disagreeing, marked by a mean of 4.67 and a standard deviation of 0.839.

Another set of results on the portals facilitating student registration for units and participation in online e-learning confirmed similarly high levels of agreement with n=188 (95%) and disagreement at n=10 (5%), with a mean of 4.38 and a standard deviation of 0.798.

The findings suggest that the portals at Puntland State University are viewed as user-friendly and easily accessible by both students and academic staff, with 170 (86%) in agreement and 28 (14%) in disagreement, resulting in a mean score of 4.21 and a standard deviation of 0.841. Furthermore, the results indicated high levels of user engagement and prompt, efficient service provision through the portals, with 195 (98%) agreeing and 3 (2%) disagreeing, recorded with a mean of 4.76 and a standard deviation of 0.765.

These results imply that portals and websites are utilized for various purposes at Puntland State University. It was found that the use of these portals and websites significantly influences public service delivery at Puntland State University in Puntland, Somalia.

4.5.5 Accessibility to digitized services on service delivery in public universities in Puntland State University

The research aimed to determine the consensus regarding the accessibility of all student services online at Puntland State University. The findings are detailed in Table 10.

Table 10: Accessibility to digitized services on service delivery in Puntland State University

Extent	Frequency	Percentage (%)
Strongly agree	26	13
Agree	89	45
Neutral	37	19
Disagree	29	15
Strongly disagree	17	8
Total	**198**	**100.0**

Source: Field Data,2024

The study examined the level of consensus regarding the accessibility of all student services online at Puntland State University. The findings indicated that the majority of respondents, 89 (45%), agreed that services are accessible online. This was followed by 26 respondents (13%) who strongly agreed. A neutral stance was taken by 37 participants (19%), while 29 (15%) disagreed, and the smallest group, 17 (8%), strongly disagreed. These results suggest that most students at Puntland State University are able to access services online.

4.5.6 Accessibility to digitized services on service delivery in public universities in Puntland State University

The study aimed to assess the level of student access to digitized services and its influence on public university service delivery in Puntland, Somalia. The ratings for the statement were categorized as follows: 1=Not at all, 2=To a minimal extent, 3=To a moderate degree, 4=To a significant extent, and 5=To an extremely high degree. The findings are displayed in Table 11.

Table 11:Extent of accessibility to digitized services in Puntland State University.

Statements	N	5 %	4 %	3 %	2 %	1 %	Mean	Std
Digitalization has allowed database sharing	198	30	45	12	8	5	4.71	.78
Digitalization has reduced the time taken to process a transaction	198	46	30	13	10	6	4.63	.82
Digitalization has improved record management	198	38	35	24	3	2	4.54	.57
The convenience of accessing information	198	33	39	20	5	3	4.36	.89
The capability to offer online services	198	37	40	16	4	3	3.90	1.21
The consolidation of services	198	34	28	12	7	9	4.49	1.03
Enhanced effectiveness of operations	198	28	34	12	9	7	4.61	.87
Streamlining of specific procedures	198	43	31	18	5	3	4.43	1.13
Enhanced service quality	198	31	38	25	4	2	4.25	.56
Increased cost-effectiveness of services	198	35	37	15	8	5	4.47	.65
Greater transparency	198	33	36	22	6	3	4.51	.78
Enhanced accessibility to administrators and information	198	45	27	19	5	4	4.17	.85
Reduced the costs of delivering services	198	42	29	25	3	1	4.32	.93

Source: Field Data,2024

The study results indicated that digitalization has improved database sharing for service delivery in public universities in Puntland, Somalia. A notable majority of respondents, accounting for 45%, strongly agreed, while 30% agreed

significantly. Additionally, 12% agreed moderately, 8% to a lesser extent, and a small percentage of 5% did not agree at all. The average response was 4.71 with a standard deviation of 0.78. These findings affirm the substantial role of digitalization in enhancing database sharing for service delivery in public universities in Puntland, Somalia.

The findings of the study suggested that digitalization has notably reduced the time required to process transactions in Puntland, Somalia. A substantial majority, comprising 46%, strongly agreed, while 30% agreed significantly. Additionally, 10% agreed moderately, another 10% to a lesser extent, and a small minority of 6% did not agree at all. The average response was 4.63 with a standard deviation of 0.82. These results indicate that digitalization has effectively expedited transaction processing times in public universities in Puntland, Somalia.

The findings of the study indicated that digitalization has reduced transaction processing times in Puntland, Somalia. A substantial majority, comprising 38%, strongly agreed, while 35% agreed significantly. Moreover, 24% agreed moderately, 3% to a lesser extent, and a tiny minority of 2% did not agree at all. The average response was 4.54 with a standard deviation of 0.57. These results suggest that digitalization has effectively shortened the time needed for transaction processing in public universities in Puntland, Somalia.

The study's results revealed that digitalization has improved the ease of accessing information in Puntland, Somalia. A majority of 39% strongly agreed, while 33% agreed significantly. Additionally, 20% agreed moderately, 5% to a lesser extent, and a very small percentage of 3% did not agree at all. The average response was

4.36 with a standard deviation of 0.89. These findings imply that digitalization has significantly improved the convenience of accessing information in public universities in Puntland, Somalia.

The findings of the study indicated that digitalization has the capacity to provide online services in Puntland, Somalia. A majority of 40% strongly agreed, while 37% agreed significantly. Furthermore, 16% agreed moderately, 4% to a lesser extent, and a very small minority of 3% did not agree at all. The average response was 3.90 with a standard deviation of 1.21. These results demonstrate that digitalization shows potential for offering online services in public universities in Puntland, Somalia.

The study results suggested that digitalization has led to the integration of services in Puntland, Somalia. A majority of 34% strongly agreed, while 28% agreed significantly. Additionally, 12% agreed moderately, 7% to a lesser extent, and a minority of 9% did not agree at all. The average response was 4.49 with a standard deviation of 1.03. These findings imply that digitalization has significantly consolidated services in public universities in Puntland, Somalia.

The study results indicated that digitalization has enhanced the efficiency of operations in Puntland, Somalia. A majority of 34% strongly agreed, while 28% agreed significantly. Additionally, 12% agreed moderately, 9% to a lesser extent, and a minority of 7% did not agree at all. The average response was 4.61 with a standard deviation of 0.87. These findings suggest a significant improvement in operational effectiveness due to digitalization in public universities in Puntland, Somalia.

The findings of the study showed that digitalization has enhanced specific processes in Puntland, Somalia. A considerable majority of 43% strongly agreed, while 31% agreed significantly. Furthermore, 18% agreed moderately, 5% to a lesser extent, and a small minority of 3% did not agree at all. The average response was 4.43 with a standard deviation of 1.13. These results suggest that digitalization has significantly optimized procedures in public universities in Puntland, Somalia.

Moreover, the research revealed that the implementation of digital technology has elevated the standard of services in Puntland, Somalia. A significant portion, 38%, strongly concurred with this notion, while 31% expressed an even stronger agreement. Additionally, 25% moderately agreed, 4% showed a minor level of agreement, and only 2% completely disagreed. On average, respondents rated their agreement at 4.25, with a standard deviation of 0.56. These findings suggest a marked enhancement in service quality within public universities in Puntland, Somalia, due to digitalization efforts.

The research results revealed that the adoption of digitalization has amplified the cost-effectiveness of services in Puntland, Somalia. A significant majority, comprising 37%, strongly agreed with this notion, while 35% expressed an even stronger concurrence. Moreover, 15% moderately agreed, 8% showed a minor level of agreement, and only 5% completely disagreed. On average, respondents rated their agreement at 4.47, with a standard deviation of 0.65. These findings strongly indicate a substantial improvement in the cost-effectiveness of services within public universities in Puntland, Somalia, attributed to digitalization initiatives.

The study findings revealed that digitalization contributes to heightened transparency in Puntland, Somalia. A significant portion, amounting to 36%, strongly agreed with this notion, while 33% expressed an even stronger agreement. Additionally, 22% moderately agreed, 6% demonstrated a minor level of agreement, and only 3% completely disagreed. On average, respondents rated their agreement at 4.51, with a standard deviation of 0.78. These results strongly indicate that digitalization has a substantial positive influence on transparency within public universities in Puntland, Somalia.

The research results indicated that digitalization has enhanced access to administrators and information in Puntland, Somalia. A significant majority, totaling 45%, strongly supported this idea, while 27% expressed a slightly lower but still considerable agreement. Furthermore, 19% moderately agreed, 5% demonstrated a minor level of agreement, and only 4% completely disagreed. On average, respondents rated their agreement at 4.17, with a standard deviation of 0.85. These findings strongly suggest that digitalization is crucial in improving accessibility to administrators and information within public universities in Puntland, Somalia.

The study findings indicated that digitalization has led to a reduction in the costs associated with providing services in Puntland, Somalia. A significant majority, accounting for 42%, strongly agreed with this assertion, while 29% expressed a slightly lower but still substantial agreement. Furthermore, 25% moderately agreed, 3% showed a minor level of agreement, and only 1% completely disagreed. On average, respondents indicated their agreement at 4.32, with a standard deviation of 0.93. These findings strongly suggest that digitalization has

substantially contributed to reducing service delivery expenses within public universities in Puntland, Somalia. In general, the results indicate that the enhanced access to digitized services for students has beneficially influenced service delivery in these universities.

4.5.7 Extent digitalization has transformed service delivery in public universities in Puntland State University

The study sought to assess the degree to which digitalization has revolutionized service provision in public universities located in Puntland, Somalia.

Participants were asked to rate pertinent statements using a scale ranging from 1 to 5, with 1 representing "Strongly disagree," 2 indicating "Disagree," 3 for "Neither agree nor disagree," 4 representing "Agree," and 5 indicating "Strongly agree." The outcomes of this assessment are outlined in Table 12:

Table 12: Digitalization has Transformed Service Delivery in Public Universities in Puntland State University

Statement	N	5 %	4 %	3 %	2 %	1 %	Mean	Std
Free internet connectivity is available within the university premises	198	43	32	21	10	4	4.49	.84
Your institution has a dependable internet connection	198	44	30	15	9	7	4.96	.97
There are a sufficient number of computers capable of accommodating the entire population of the University	198	38	21	18	13	10	4.40	.68
University e-services are easily accessible to both male and female students	198	31	33	24	11	6	4.62	.84
Equitable service delivery is ensured irrespective of the level of study.	198	31	28	19	13	9	4.41	.75

Source: Field Data,2024

The research results revealed that there is widespread availability of free internet connectivity within the university grounds in Puntland, Somalia. A significant majority, comprising 43%, strongly agreed with this observation, while 32% expressed a slightly lower but still substantial agreement. Furthermore, 21% moderately agreed, 10% showed a minor level of agreement, and only 4% completely disagreed. On average, respondents rated their agreement at 4.49, with a standard deviation of 0.84. These findings strongly suggest that free internet access is readily accessible within the university premises in public universities across Puntland, Somalia.

The research findings unveiled that there is a dependable internet connection available at the institution in Puntland, Somalia. A significant majority, comprising 44%, strongly agreed with this observation, while 30% expressed a slightly lower but still substantial agreement. Additionally, 15% moderately agreed, 9% showed a minor level of agreement, and only 7% completely disagreed. On average, respondents rated their agreement at 4.96, with a standard deviation of 0.97. These results strongly suggest that the institution possesses a reliable internet connection within public universities in Puntland, Somalia.

The research findings suggested that there is an ample number of computers available to cater to the entire university population in Puntland, Somalia. A significant majority, comprising 38%, strongly agreed with this notion, while 21% expressed a slightly lower but still considerable agreement. Additionally, 18% moderately agreed, 13% showed a minor level of agreement, and only 10% completely disagreed. On average, respondents rated their agreement at 4.40, with a standard deviation of 0.68. These results strongly imply that the university possesses a sufficient number of computers to accommodate its entire population in Puntland, Somalia.

The research findings suggested that both male and female students in Puntland, Somalia, find university e-services easily accessible. A significant majority, comprising 33%, strongly agreed with this notion, while 31% expressed an even stronger agreement. Additionally, 24% moderately agreed, 11% showed a minor level of agreement, and only 6% completely disagreed. On average, respondents rated their agreement at 4.62, with a standard deviation of 0.84. These results

strongly imply that university e-services are readily accessible to all students in Puntland, Somalia.

The research findings suggested that regardless of the level of study, equitable service delivery is ensured in Puntland, Somalia. A significant majority, comprising 31%, strongly agreed with this notion, while 28% expressed a slightly lower but still substantial agreement. Additionally, 19% moderately agreed, 13% showed a minor level of agreement, and only 9% completely disagreed. On average, respondents indicated their agreement at 4.41, with a standard deviation of 0.75. These findings strongly suggest that equitable service delivery is upheld across all academic levels in Puntland, Somalia. Overall, the results suggest that digitalization has instigated a revolution in service delivery within public universities in Puntland, Somalia.

4.5.8 Challenges of digitalization on service delivery in public universities in Puntland State University

The study aimed to identify the challenges presented by digitalization to service delivery in public universities in Puntland, Somalia. Participants assessed related statements on a scale from 1 to 5, where 1 denoted "Strongly disagree," 2 for "Disagree," 3 for "Neither agree nor disagree," 4 for "Agree," and 5 for "Strongly agree." The results are detailed in Table 13.

Table 13: Challenges of digitization on service delivery in public universities

Challenges	N	5 %	4 %	3 %	2 %	1 %	Mean	Std
Resistance to change within administration.	198	31	34	31	8	6	4.28	.74
Concerns about security and confidentiality	198	34	45	11	8	7	4.69	.91
Lack of political will and drive	198	21	31	26	19	8	4.66	.79
Lack of skills amongst administration staff	198	28	31	28	15	8	4.47	.73
Lack of high level championship.	198	28	41	19	12	11	4.12	.83
Students unresponsiveness.	198	31	43	14	13	9	4.62	.84
Concerns about risk and frauds	198	39	31	17	14	9	4.48	.88

(Source field data,2024)

The research results unveiled that resistance to change among the administration is a significant challenge in Puntland, Somalia. A substantial majority, comprising 34%, strongly agreed with this observation, while 31% expressed an even stronger agreement. Additionally, 21% moderately agreed, 8% showed a minor level of agreement, and only 6% completely disagreed. On average, participants indicated their agreement at 4.28, with a standard deviation of 0.74. These results strongly indicate that there is a significant challenge posed by resistance to change within the administration of public universities in Puntland, Somalia.

The research results indicated that security and confidentiality issues present significant challenges in Puntland, Somalia. A substantial majority, totaling 45%,

strongly agreed with this observation, while 34% expressed an even stronger agreement. Furthermore, 11% moderately agreed, 8% indicated a minor level of agreement, and only 7% completely disagreed. On average, respondents rated their agreement at 4.69, with a standard deviation of 0.91. These findings strongly suggest that concerns regarding security and confidentiality pose notable challenges in public universities in Puntland, Somalia.

The research findings uncovered that a lack of political determination and initiative presented a significant challenge in Puntland, Somalia. A substantial majority, accounting for 31%, strongly agreed with this notion, while 21% expressed an even stronger agreement. Additionally, 26% moderately agreed, 19% indicated a minor level of agreement, and only 8% completely disagreed. On average, respondents rated their agreement at 4.66, with a standard deviation of 0.79. These results strongly suggest that the deficiency in political will and drive represents a notable challenge in Puntland, Somalia.

The research findings suggested that a deficit in skills among administrative personnel posed a significant challenge in Puntland, Somalia. A substantial majority, comprising 31%, strongly agreed with this observation, while 28% expressed an even stronger agreement. Additionally, 28% moderately agreed, 15% showed a minor level of agreement, and only 8% completely disagreed. On average, participants indicated their agreement at 4.47, with a standard deviation of 0.73. These findings strongly suggest that the inadequacy of skills among administrative staff poses a significant challenge in Puntland, Somalia.

The research findings revealed that the absence of strong leadership at high levels posed a significant challenge in Puntland, Somalia. A significant majority,

comprising 41%, strongly agreed with this observation, while 28% expressed an even stronger agreement. Additionally, 19% moderately agreed, 12% showed a minor level of agreement, and only 11% completely disagreed. On average, participants indicated their agreement at 4.12, with a standard deviation of 0.83. These findings strongly suggest that the absence of top-level leadership poses a significant challenge in Puntland, Somalia.

The research findings indicated that student unresponsiveness posed a significant challenge in Puntland, Somalia. A significant majority, accounting for 43%, strongly agreed with this observation, while 31% expressed an even stronger agreement. Additionally, 14% moderately agreed, 13% indicated a minor level of agreement, and only 9% completely disagreed. On average, participants rated their agreement at 4.62, with a standard deviation of 0.84. These results strongly suggest that student unresponsiveness presents a notable challenge in Puntland, Somalia.

The research findings suggested that concerns regarding risk and fraud presented significant challenges in Puntland, Somalia. A significant majority, comprising 39%, strongly agreed with this observation, while 31% expressed an even stronger agreement. Additionally, 17% moderately agreed, 14% indicated a minor level of agreement, and only 9% completely disagreed. On average, participants rated their agreement at 4.48, with a standard deviation of 0.88. These results strongly indicate that apprehensions about risk and fraud represent notable challenges in Puntland, Somalia. Overall, the findings suggest that various obstacles impede digitalization in service delivery at public universities in Puntland, Somalia.

4.6 Diagnostic Test

4.6.1 Autocorrelation Assumption Test

Autocorrelation pertains to the correlation of a variable with itself over time. The outcomes of the autocorrelation assumption test are outlined in Table 14.

Table 14: Autocorrelation Assumption Test Results

Variable	Durbin-Watson
Status of resources	2.361
Accessibility to digitized services	2.513
Extent of digitalization	2.248
Challenges of digitization	2.304
Service delivery	2.534

Source: Field Data,2024

The findings presented in Table 14 depicted the Durbin-Watson statistic values for various variables: 2.361 for resource status, 2.513 for access to digitized services, 2.248 for the level of digitalization, 2.304 for digitization challenges, and 2.534 for service delivery in public universities in Puntland, Somalia. These values indicate that the study variables exhibited independence of errors, falling within the Durbin-Watson threshold of 0 to 4. Specifically, values between 0 and 2.5 indicate the absence of autocorrelation. In conclusion, the data collection instruments were validated and deemed reliable, confirming their suitability for use in the main study.

4.6.2 Normality Assumptions Test

The research conducted a normality assessment to evaluate the distribution of the data for normality. The results of this examination are depicted in Table 15.

Table 15: Normality Assumption Test Results

Variable	Kolmogorov- Smirnov	Sig
Status of resources	.389	.553
Accessibility to digitized services	.398	.671
Extent of digitalization	.274	.567
Challenges of digitization	.332	.718
Service delivery	.364	.723

Source, field 2024

The results of the normality assumption test provided in Table 15 confirmed that the data followed a normal distribution, as indicated by the significance values for the Kolmogorov-Smirnov test, which were greater than 0.05. The study revealed that the resource status had a Kolmogorov-Smirnov significance value of p=.553, surpassing the threshold of 0.05. Similarly, accessibility to digitized services showed a Kolmogorov-Smirnov significance value of p=.671, while the extent of digitalization and the challenges of digitization both displayed significance values of p=.567 and p=.718, respectively. Additionally, the significance value for service delivery was determined to be p=.723. As all p-values exceeded the significance level of 0.05, it can be concluded that the data followed a normal distribution.

4.6.3 Multicollinearity Test

Multicollinearity arises when two or more independent variables exhibit a significant correlation. In a regression model influenced by multicollinearity, discerning the distinct impact of each independent variable on the outcomes becomes challenging. The study's results concerning this issue are elaborated in Table 16.

Table 16: Multicollinearity Assumption Test Results

Variables	Tolerance	VIF
Status of resources	.473	1.365
Accessibility to digitized services	.559	1.291
Extent of digitalization	.568	1.234
Challenges of digitization	.618	1.256
Service delivery	.629	1.274

Source, field 2024

Based on the findings, the tolerance and variance inflation factor (VIF) values for the variables were as follows: for the status of resources, the tolerance was 0.473 and VIF was 1.365; for accessibility to digitized services, the tolerance was 0.559 and VIF was 1.291; for the extent of digitalization, the tolerance was 0.568 and VIF was 1.234; for challenges of digitization, the tolerance was 0.618 and VIF was 1.256; and for service delivery, the tolerance was 0.629 and VIF was 1.274.

The findings of the study indicate that for all five variables investigated, the tolerance values were higher than 0.10, and the VIF values were below 10. This suggests the absence of multicollinearity in the analyzed data.

4.6.4 Homoscedasticity test results

Homoscedasticity refers to the consistency of errors between independent and dependent variables, irrespective of the different levels of the independent variables. It signifies a uniform pattern of residual terms across observations. Conversely, when errors are not consistent, it results in a problem known as heteroscedasticity. Heteroscedasticity may result in less precise parameter estimations and inaccurate confidence intervals. When data exhibits

homoscedasticity, it's common for the p-value to exceed 0.05. Table 17 illustrates the results of the homoscedasticity assessment.

Table 17: Homoscedasticity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.017	.274		.161	.769
	Status of resources	.061	.053	.083	-.142	.742
	Accessibility to digitized services	.079	.086	.235	1.014	.659
	Extent of digitalization	.097	.092	.046	.286	.734
	Challenges of digitization	.059	.044	.061	-.345	.757

a. Dependent Variable: Service Delivery

The results presented in Table 17 show that the p-values for resource status, access to digitized services, degree of digitalization, and digitization challenges were 0.742, 0.659, 0.734, and 0.757, respectively. Each of these values surpasses 0.05, indicating homoscedasticity in the data and the absence of heteroscedasticity. These findings helped confirm the suitability of the linear regression analysis to the researcher.

4.6.5 Linearity Test Results

Linearity assessments were conducted to evaluate the linear relationships among resource status, access to digitized services, degree of digitalization, and challenges of digitization within public universities in Puntland, Somalia. The outcomes of these analyses are presented in Tables 18 to 21.

Table 18: Linearity Between Status of Resources and Service Delivery

			Sum of Squares	df	Mean Square	F	Sig.
Service delivery * Status of resources	Between Groups	(Combined)	3.638	118	.347	3.241	.018
		Linearity	1.121	12	2.019	19.312	.001
		Deviation from Linearity	1. 644	107	.163	1.713	.143
	Within Groups		1.566	118	.101		
	Total		**4.330**	**198**			

Source, field 2024

The results reveal a p-value of 0.143 for the departure from linearity. Typically, a departure from linearity exceeding 0.05 is necessary to establish a linear relationship. As 0.143 surpasses this threshold, it implies the presence of a linear connection between resource status and service delivery. This linear correlation will aid in inferential statistical inquiries, particularly in comprehending the causal connection between resource status and service delivery in public universities in Puntland, Somalia.

Table 19: Linearity between accessibility to digitized services and service delivery

			Sum of Squares	df	Mean Square	F	Sig.
service delivery* Accessibility to digitized services	Between Groups	(Combined)	2.639	118	.328	3.111	.017
		Linearity	2.332	12	2.038	17.512	.001
		Deviation from Linearity	1.633	107	.121	1.722	.136
	Within Groups		1.556	118	.108		
	Total		5.651	198			

(*Source, field 2024)*

The results indicate a p-value of 0.136 for the departure from linearity. Typically, a departure from linearity exceeding 0.05 is required to establish a linear relationship. With a value of 0.136 exceeding this threshold, it suggests a linear association between accessibility to digitized services and service delivery. This linear correlation will help strengthen inferential statistical analysis, particularly in elucidating the causal connection between access to digitized services and service delivery in public universities in Puntland, Somalia.

Table 20: Linearity between extent of digitalization and service delivery

			Sum of Squares	df	Mean Square	F	Sig.
Service delivery * Extent of digitalization	Between Groups	(Combined)	2.539	118	.478	3.201	.016
		Linearity	1.122	12	2.119	19.712	.001
		Deviation from Linearity	1.523	107	.161	1.612	.186
	Within Groups		1.547	118	.105		
	Total		4.222	198			

(*Source, field 2024)*

The findings show a p-value of 0.186 for the departure from linearity. Normally, for a linear relationship to exist, the departure from linearity should be above 0.05. Since the value of 0.186 exceeds this threshold, it suggests a linear association between the extent of digitalization and service delivery. This linear correlation will aid in enhancing inferential statistical analysis, specifically in comprehending the causal link between the extent of digitalization and service delivery in public universities in Puntland, Somalia.

Table 20: Linearity between Challenges of digitalization and service delivery

			Sum of Squares	df	Mean Square	F	Sig.
Service delivery * Challenges of digitalization	Between Groups	(Combined)	2.539	118	.487	3.221	.018
		Linearity	2.221	12	2.019	19.714	.001
		Deviation from Linearity	1.523	107	.197	1.612	.176
	Within Groups		1.547	118	.106		
	Total		**5.423**	**98**			

(*Source, field 2024)*

The findings show a p-value of 0.176 for the departure from linearity, suggesting a linear relationship between challenges of digitalization and service delivery, as it exceeds the threshold of 0.05. This linear correlation will strengthen inferential statistical analysis, particularly in elucidating the causal relationship between challenges of digitalization and service delivery in public universities in Puntland, Somalia.

4.7 Inferential Statistics

4.7.1 Correlation Analysis

4.7.1.1 Status of resources and service delivery in public universities in Puntland, Somalia.

The study aimed to determine the connection between resource status and service delivery. The findings of the inquiry are presented in Table 20.

Table 20: Status of Resources and Service Delivery

		Service delivery
Status of resources	Pearson Correlation	.476**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 20, the research reveals a moderately positive and statistically significant relationship between resource status and service delivery in public universities in Puntland, Somalia ($r = 0.476$; $p < 0.05$). This suggests that the condition of resources impacts service delivery in public universities in Puntland, Somalia.

4.7.1.2 Accessibility to digitized services and service delivery in public universities in Puntland, Somalia.

The aim of the study was to examine the association between access to digitized services and service delivery in public universities in Puntland, Somalia. The findings of this investigation are summarized in Table 21.

Table 21: Digitized services and service delivery in public universities in Puntland, Somalia.

		Service delivery
Digitized services	Pearson Correlation	.458**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 21, the research suggests a moderately positive and statistically significant correlation between digitized services and service delivery in public universities located in Puntland, Somalia ($r = 0.458$; $p < 0.05$). This indicates that digitized services influence service delivery within public universities in Puntland, Somalia.

4.7.1.3 Extent of digitalization and service delivery in public universities in Puntland, Somalia

The research aimed to explore the correlation between the extent of digitalization and service delivery in public universities situated in Puntland, Somalia. The outcomes of this investigation are delineated in Table 22.

Table 22: Extent of digitalization and service delivery

		Service delivery
Extent of digitalization	Pearson Correlation	.485**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

As depicted in Table 22, the research demonstrates a moderately positive and statistically significant link between the extent of digitalization and service delivery in public universities located in Puntland, Somalia ($r = 0.485$; $p < 0.05$). This suggests that the level of digitalization influences service delivery within public universities in Puntland, Somalia.

4.7.1.4 Challenges of digitalization and service delivery in public universities in Puntland, Somalia

The research aimed to examine the connection between the challenges of digitalization and service delivery in public universities in Puntland, Somalia. The findings of this inquiry are elaborated in Table 23.

Table 23: Challenges of digitalization and service delivery

		Service delivery
Challenges of digitalization	Pearson Correlation	.479**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

According to the data presented in Table 23, the research indicates a moderately positive and statistically significant correlation between challenges related to digitalization and service delivery in public universities located in Puntland, Somalia ($r = 0.479$; $p < 0.05$). This suggests that obstacles associated with digitalization affect service delivery in public universities within Puntland, Somalia.

4.8 Regression Analysis

The research conducted a regression analysis to assess the impact of resource status, access to digitized services, extent of digitalization, and challenges associated with digitization on service delivery in public universities in Puntland, Somalia. The model summary was presented in Table 24.

Table 24 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change .000
1	.881[a]	.776	.786	.3071	

In this study, the R-squared value was 0.786, indicating that the four independent variables—resource status, access to digitized services, extent of digitalization, and challenges associated with digitization—jointly explain 78.6% of the variability in service delivery within public universities in Puntland, Somalia. The remaining 21.4% of the variability is attributed to other factors.

Table 25 : ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.31	4	7.101	100.306	.000[b]
	Residual	7.031	194	.1002		
	Total	**34.062**	**198**			

a. Dependent Variable: Service delivery in public universities in Puntland, Somalia

b. Predictors: (Constant), status of resources, accessibility to digitized services, extent of digitalization and challenges of digitization

The analysis of variance in this study aimed to assess the suitability of the model for the dataset. The findings revealed a p-value of 0.000, indicating that the model effectively predicts the impact of the four independent variables—resource status, access to digitized services, extent of digitalization, and challenges associated with digitization—on service delivery in public universities in Puntland, Somalia. Additionally, the F-value of 100.306 suggests that the model is highly proficient in forecasting the effects of the independent variables on the dependent variable.

Table 26: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.087	.173		.206	.747
	Status of resources	.386	.181	.543	5.368	.037
	Accessibility to digitized services	.343	.047	.293	2.617	.002
	Extent of digitalization	.295	.193	.172	2.323	.071
	Challenges of digitization	.338	.140	.218	3.307	.006

Table 26 presents the comprehensive results of the significance test the hypothesized research model. The interpretations of the findings align with the following regression model:

$Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \beta_4X_4$

Thus,

$Y= 0.087+ 0.386X_1 + 0.343\ X_2 +0.295X_3 + 0.338\ X_4$+error term

As per the intercept (β_0), when all four independent variables remain constant, service delivery in public universities in Puntland, Somalia, was at 0.087. Additionally, with all other independent variables held constant, an increase of one unit in resource status would correspond to a 0.386 improvement in service delivery within public universities in Puntland, Somalia. Likewise, assuming all other independent variables remain unchanged, a one-unit increase in access to digitized services would lead to a 0.343 enhancement in service delivery within public universities in Puntland, Somalia.

Additionally, while keeping all other factors constant, a one-unit increase in the extent of digitalization would lead to a 0.295 enhancement in service delivery

within public universities in Puntland, Somalia. Finally, assuming all other factors remain unchanged, a one-unit increase in challenges associated with digitization would yield a 0.338 effect on service delivery within public universities in Puntland, Somalia. These results indicate that resource status had the most notable influence on service delivery in public universities in Puntland, Somalia, followed by accessibility to digitized services, challenges linked to digitization, and extent of digitalization, in that sequence.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a thorough overview of the main discoveries derived from the investigation, followed by conclusions and a discussion regarding the implications of these findings. Furthermore, it offers recommendations and proposes avenues for future research. The research aimed to assess the connection between digitalization and the efficiency of public service delivery at Puntland State University in Puntland, Somalia.

5.2 Summary of Major Findings

The study aimed to summarize the key findings, organized according to specific objectives.

5.2.1 Status of resources in digitized program and service delivery in public universities in Puntland, Somalia

The research findings revealed that the majority of respondents, 119 out of 198 (60%), reported that the university's computers were inadequate to serve the student population. This indicates that Puntland State University employs portals and websites for multiple functions. The research highlighted that portals facilitate online student applications, streamlining admissions and accommodation processes. Furthermore, financial transactions like university fee payments and inquiries are conducted conveniently through these portals. Additionally, students can register for courses and engage in e-learning activities via the portals. The study found that the portals are user-friendly and readily

accessible for both students and academic staff. Moreover, the findings revealed high user engagement with the portals, which offered prompt and effective services to users.

The results indicated that Puntland State University employs portals and websites for diverse functions, affecting public service delivery within the institution. In summary, the research unveiled that the resource status within digital initiatives influences service delivery in public universities in Puntland, Somalia.

5.2.2 Accessibility to digitized services on service delivery in public universities in Puntland State University

The research findings unveiled that a large portion of students utilize online services at Puntland State University. The study suggested that digitalization has enabled the sharing of databases to enhance service delivery in public universities in Puntland, Somalia, and has notably decreased transaction processing times. Moreover, digitalization has enhanced the accessibility of information and exhibited the potential to provide a range of online services. Additionally, it has led to the integration of services and improved operational efficiency in public universities in Puntland. The study also demonstrated that digitalization simplifies certain procedures within these institutions.

The results indicated that digitalization improved service standards at public universities in Puntland, Somalia. They showed that digitalization increased the efficiency of services and encouraged transparency. Furthermore, its simplified access to administrators and information, while decreasing service delivery expenses. In conclusion, the findings highlighted the substantial influence of

students' access to digitized services on service delivery in public universities in Puntland, Somalia.

5.2.3 Extent digitalization has transformed service delivery in public universities in Puntland State University

The investigation revealed that Puntland State University in Somalia provides complimentary internet access on campus and maintains a reliable connection. Furthermore, the results indicated that there are sufficient computers to accommodate the university community. Additionally, electronic services offered by the university are easily accessible to both male and female students, ensuring fair service provision across all academic levels. Overall, the findings underscored the transformative impact of digitalization on service delivery in public universities in Puntland, Somalia.

5.2.4 Challenges of digitalization on service delivery in public universities in Puntland State University

The study revealed several challenges to digitalization in Puntland, Somalia. Resistance to change within the administration, concerns about security and confidentiality, and a lack of political will and drive were significant obstacles. Additionally, the findings indicated that the lack of skills among administrative staff, the absence of high-level leadership, student unresponsiveness, and concerns about risks and frauds posed further challenges. Overall, the results highlighted various issues impacting the digitalization of service delivery in public universities in Puntland, Somalia.

5.3 Conclusions

Based on the findings, the study determined that there is a moderate positive and statistically significant association between resource status and service delivery in public universities in Puntland, Somalia ($r = 0.476$; $p < 0.05$). This indicates that resource status influences service delivery in these universities. Likewise, the research revealed a moderate positive and statistically significant correlation between digitized services and service delivery in public universities in Puntland, Somalia ($r = 0.458$; $p < 0.05$), suggesting that digitized services affect service delivery in these institutions.

The study revealed a moderate positive and statistically significant association between the extent of digitalization and service delivery in public universities in Puntland, Somalia ($r = 0.485$; $p < 0.05$), indicating that the level of digitalization influences service delivery in these institutions. Additionally, it unveiled a moderate positive and statistically significant correlation between the challenges linked to digitalization and service delivery in public universities in Puntland ($r = 0.479$; $p < 0.05$), suggesting that obstacles related to digitalization impact service delivery. These four independent variables—resource status, access to digitized services, degree of digitalization, and challenges of digitalization—account for 78.6% of the variance in service delivery in public universities in Puntland, Somalia, with other factors contributing to the remaining 21.4%. Among these variables, resource status had the most significant effect on service delivery, followed by access to digitized services, challenges of digitalization, and the degree of digitalization, in that order.

5.4 Recommendations

According to the findings of the study, the researcher suggested augmenting the accessibility of digital resources to improve the effectiveness of digitized service delivery initiatives in public universities in Puntland, Somalia. Additionally, the research also suggested improving students' access to digitized services to boost service delivery in these institutions. Additionally, it recommended extending digitalization to transform service delivery at Puntland State University. Moreover, the research recommended tackling the obstacles hindering digitalization to foster efficient service delivery in public universities located in Puntland.

5.5 Suggestion for Further Studies

Subsequent studies should prioritize examining the obstacles impeding digitalization and investigate tactics to resolve these challenges, aiming to improve service delivery in public universities, with a specific emphasis on Puntland State University.

LIST OF REFERENCES

Adeboye, T. O. (2015). November). Governance and Economic Development. Paper Presented at Good Governance for Africa Conference, Maastricht, and NL.

Adegboyega, O. Tomasz. J., Elsa. E., and Irshad, K. K. (2017), Human Capacity Development for e-Government .UNU-IIST Report No. 362.

Ani, O. E. (2017). Information and communication technologies, revolution in African librarianship: problems and prospects. *Gateway journal* 10(2)111-188.

Bannister, F. (2017).Dismantling the silos: extracting new value from IT investments in public administration. Information Systems Journal 11, 65-84.

Best J. W., & Kahn J. V. (2016). Research in education (10th Ed.). Boston: Pearson Education, Inc.

Chen, C. L., Lin, Y. C., Chen, W. H., Chao, C. F., & Pandia, H. (2021). Role of government to enhance digital transformation in small service business. Sustainability (Switzerland), 13(3), 1–26. https://doi.org/ 10.3390/su 130310 28

Gunmala Suri (2015).Organizational culture in ICT implementation and knowledge management in Spanish and Indian Universities: A Conceptual Model; published in A Special Interest Groups of CSI

Hague, C., & Williamson, B. (2019). Digital participation, digital literacy, and University subjects: A review of the policies, literature and evidence. Bristol, UK: Futurelab:Retr ievedfromhtt://www.futurelab.org.uk /resources/ documents/lit_review s/DigitalParticipation.pdf

Jibril A (2019). Government to make ICT training compulsory: the nation, Tuesday, August 18:17.

Filgueiras, F., Flávio, C., & Palotti, P. (2019). Digital Transformation and Public Service Delivery in Brazil. Latin American Policy, 10(2), 195–219. *https://doi.org/10.1111/lamp.12169*

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. Evidence-Based Nursing, 18(3), 66–67. https://doi.org/10.1136/eb-2015-102129

Kitsios, F., Kamariotou, M., & Mavromatis, A. (2021). Drivers and Outcomes of Digital Transformation: The Case of Public Sector Services. Information (Switzerland), 14(1). https://doi.org/10.3390/info14010043

Larsson, A., Elf, O., Gross, C., & Elf, J. (2019). Welfare services in an era of digital disruption how digitalization reshapes the health care market. In Digital Transformation and Public Services: Societal Impacts in Sweden and Beyond. https://doi.org/10.4324/9780429319297-3

Mendybayev, B., & Burbayeva, P. (2021). Digital Transformation: A Case Study of Organizational and Functional Changes of the Public Services Provider. SIST 2021 -2021 IEEE International Conference on Smart

Information Systems and Technologies, 28–30. *https://doi.org/10. 1109/SIST50301.2 021.9465 972*

Mohajan, H. K. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. Annals of Spiru Haret University. Economic Series, 17(4), 59–82. *https://doi.org/10.26458/1746*

Mwanza, M. W. (2021). Digitalization , Strategy And Public Service Delivery In The Ministry Of Lands Kenya. November, 45.

Osborne, S. P., Cucciniello, M., Nasi, G., & Zhu, E. (2022). Digital transformation, artificial intelligence and effective public services: challenges and opportunities. Global Public Policy and Governance, 2(4), 377–380. https://doi.org/10.1007/s43508-022-00058-7

Waller, L., & Genius, A. (2015). Barriers to transforming government in Jamaica: Challenges to implementing initiatives to enhance the efficiency, effectiveness and service delivery of government through ICTs (e-Government). Transforming Government: People, Process and Policy, 9(4), 480–497. *https://doi.org/10.1108/TG-12-2014-0067*

Kettl, D. (2018). The global public management revolution. Washington, D.C.: Brookings Institution Press

Kothari, C. R. (2015). Research Methodology: Methods and techniques. *New Delhi:* Wiley Eastern.

Magni (2019). ICT usage in Higher Education, International Technology and Education and Development Conference, Spain March 9-11 2019

Maki, C. (2018). Information and Communication Technology for Administration Management, Volume 24, No. 2, pp. 172-19

Markoff, J.(2020): A Newer, Lonelier Crowd Emerges in Internet Study. *New York Times, February 16, A1*.

Moon, M. J. (2020).'The evaluation of local government among municipalities: rhetoric or reality? *'Public Administration Review, July/August 2002, Vol.62, No.4.*

Nwachukwu, V.M. (2015). Information technology application to libraries in developing countries: the need for caution, *Global Review of Library and Information Science1(1) 94-100.*

Okore, A.M. (2015). The challenges of ICT for Nigeria academic libraries. Global review of library and information science 1(1) 84-93.

Omekwu, C. O (2017). Information technology and technical services proceedings of the national workshop on technical services in law libraries 60-73.

Palvia, S.C., & Sharma, S. S. (2017). E-government and e-governance: Definitions/domain framework and status around the world, the foundation of e- government, ICEG, 1-12.

APPENDICES

Appendix 1: Informed Consent Form

TO WITHDRAW FROM THE STUDY AT ANY POINT IF YOU DECIDE TO DO SO.

If you agree to take part in this study, please sign below: Participant's Signature: ……. Date: …….

If you have any queries, please contact the following:

Mobile phone: +252-907712243 or by email: yusufibra121@gmail.comSincerely,

Yusuf Ibrahim Salah

CONSENT

After thoroughly examining the provided information, understanding it fully, and having the opportunity to seek clarification, I affirm that my participation in this study is entirely voluntary. I understand that I can withdraw from the study at any time without needing to provide a reason and without facing any costs. I understand that I will receive a copy of this consent form. With complete understanding, I willingly agree to participate in this study.

Participant's signature _____ Date:_____

Investigator's signature _____
Date:_____

Appendix II: Questionnaire for the Head of Departments and Digital Officers

Introduction

Dear respondent

I am Yusuf Ibrahim Salah, currently enrolled as a student at Mount Kenya University. I am conducting a research study titled "Assessing the correlation between digitalization and public service delivery in public universities, focusing on Puntland State University, Somalia." The purpose of this questionnaire is to gather data related to this topic. All information gathered will be used solely for academic purposes, and confidentiality will be maintained for all responses. I kindly ask you to accurately fill out this questionnaire in the spaces provided or by selecting the appropriate answers (use ticks for multiple-choice options).

Part A: General Information.

Please appropriately.

1. Gender

   Male [ ] Female [ ]

2. Education Level?

   Certificate ☐

   Diploma ☐

   Bachelor ☐

   Masters ☐

   PhD

3. Length of period in current position in years ?

   1-5

   6-10

   11-15

   Over 16

4. Current position……

SECTION B: Resources Status usage in digitized programme on service delivery in public universities ?

(a) Are there adequate computers in your University that can serve the whole students population?

Yes [ ] No [ ]

(c) What is your level of agreement on portals and websites used the University?

Strongly Disagree [ ]

Disagree [ ]

Neutral [ ]

Agree [ ]

6. Use (√) to tick in the provided spaces below on statements below.

Statement	YES(√)	NO(√)
Portals enable students to apply online for admission and accommodation.		
Portals facilitate online application for student admission and accommodation.		
Online financial services, such as university fee payments and inquiries, are provided through the portals.		
Portals enable students to register for units and participate in e-learning through online platforms.		
Portals are designed to be user-friendly and easily accessible to both students and academic staff members.		
Portals experience high user engagement and provide prompt and efficient services to users.		
Portals have played a crucial role in implementing e-governance within the university, leading to decreased congestion and		

University services are accessible from any location, whether inside or outside the university, as long as an internet connection is available.		
Servers are overseen by IT experts, ensuring that there are no instances of inconveniences such as server breakdowns or crashes.		

Appendix II1 : Questionnaire for Students

Dear respondent

I am Yusuf Ibrahim Salah, currently enrolled as a student at Mount Kenya University. My research focuses on examining the connection between digitalization and public service delivery, particularly within public universities like Puntland State University, Somalia. This questionnaire aims to gather insights on this topic. All data collected will be used solely for academic purposes, and confidentiality will be upheld for all responses. Please kindly provide accurate information by completing the questionnaire in the provided spaces or selecting the appropriate answers (use ticks for multiple-choice options).

This questionnaire aims to collect data regarding the influence of digitization on service delivery within public universities, with a specific emphasis on those in Puntland, Somalia. The details shared here will remain confidential and will only be utilized for this research project, with no alternative intentions. Instructions for completing the questionnaire are provided below.

i. Refrain from including your name anywhere within the questionnaire.
ii. Make sure that each question is accompanied by appropriate responses to the best of your ability.

Section A: General Information.

Please tick as appropriate.

1. Gender

Male [ ]
Female [ ]

2. Level of study?

Diploma [ ] Undergraduate [ ] Masters [ ] PhD [ ]

SECTION B: Extent of digitalization on service delivery

4. All students' services by the university are accessible online.

Strongly Agree [ ]
Agree [ ]
Moderate [ ]
Disagree [ ]

5. Please use the scale of 1-5 to indicate your agreement with the statements below regarding the extent of digitization in your institution. The scale is as follows:

1 - very great extent, 2 - great extent, 3 - moderate extent, 4 - low extent, and

5- very low extent. Please mark (√) your agreement with each statement in the table provided.

Statements	**1**	**2**	**3**	**4**	**5**
Digitalization has allowed database sharing					
Digitalization has reduced the time taken to process a transaction					
Digitalization has improved record management					
The convenience of accessing information					
The capability to offer online services					
The consolidation of services					
Enhanced effectiveness of operations					
Streamlining of specific procedures					
Enhanced service quality					
Increased cost-effectiveness of services					
Greater transparency					
Enhanced accessibility to administrators and information					
Reduced the costs of delivering services					

SECTION C: Accessibility to digitized services on service delivery in Public Universities

Please use the scale of 1-5 to indicate your level of agreement with the statement regarding Access and Equity in ICT service delivery in public universities. The scale is as follows: 1 - Strongly disagree, 2 - Disagree, 3 - Neither agree nor disagree, 4 - Agree, and 5 - Strongly agree. Please mark (√) your agreement level in the appropriate space provided.

Statements	**1**	**2**	**3**	**4**	**5**
Free internet connectivity is available within the university premises					
Your institution has a dependable internet connection					
There are a sufficient number of computers capable of accommodating the entire population of the University					
University e-services are easily accessible to both male and female students					
Equitable service delivery is ensured irrespective of the level of study.					

PART D: Challenges of digitization on service delivery in public universities and their mitigating strategies Given a scale of 1-5, (1. Strongly disagree, 2. Disagree, 3. Neither agree nor disagree, 4, Agree and 5. Strongly disagree) Please indicate using a tick (√) to show your level of agreement with the statement about Challenges of digitization in public universities.

Challenges	**1**	**2**	**3**	**4**	**5**
Resistance to change within administration.					
Concerns about security and confidentiality					
Lack of political will and drive					
Lack of skills amongst administration staff					
Lack of high level championship.					
Concerns about risk and frauds.					

Appendix IV: ERC Letter

Mount Kenya University

REF: **MKU/ISERC/3535**
TO: **YUSUF IBRAHIM SALAH**

Date: 16 March 2024

REG: **MPAM/2019/48418**

Dear Sir/Madam,

RE: EVALUATING RELATIONSHIP BETWEEN DIGITALIZATION AND PUBLIC SERVICE DELIVERY IN PUBLIC UNIVERSITIES, A CASE OF PUNTLAND STATE UNIVERSITY, SOMALIA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2579.** The approval period is **16/03/2024 - 15/03/2025.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to comply with any additional requirements from the relevant authorities in the country where this study will be conducted

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

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

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

Appendix V: MKU Introductory Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPAM/2019/48418

18th March, 2024

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: YUSUF IBRAHIM SALAH – REGISTRATION NO. MPAM/2019/48418

The purpose of this letter is to introduce the above named student who is pursuing **Master of Arts in Public Administration and Management** in the department of **Management** in the school of **Business and Economics**

The title of the research is **"Evaluating Relationship Between Digitalization and Public Service Delivery in Public Universities, A Case of Puntland State University, Somalia."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **March, 2024 and May, 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

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

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

Appendix VI: Puntland State University Introductory Letter

PUNTLAND STATE
UNIVERSITY
Telephone: +252-5-846167/907 795668
Email: registrar@psu.edu.so, Website: www.psu.edu.so
Office of the Academic Registrar

June 05, 2024

Mount Kenya University

Thika, Kenya

Dear Sir/Madam,

Re: Confirmation of Data Collection by Yusuf Ibrahim Salah

We are writing to confirm that **Mr. Yusuf Ibrahim Salah,** a student from Mount Kenya University, successfully conducted his data collection at Puntland State University, Garowe, Somalia.

Mr. Yusuf arrived at our institution in March 03, 2024 and completed his data collection on May 30, 2024. During his stay, he was engaged in research entitled "Evaluating the Relationship Between Digitalization and Public Service Delivery in Public Universities: A Case Study of Puntland State University in Garowe, Puntland, Somalia." He adhered to all our university's protocols and conducted his work in a diligent and professional manner.

We were pleased to host Mr. Yusuf Ibrahim and facilitate his research. His presence was mutually beneficial, contributing to the academic exchange between our institutions.

If you have any questions in this regard, please do not hesitate to contact us at the above address.

Yasin Mohamoud Mohamed

Deputy Academic Registrar

Appendix VII: Similarity Index Report

Yusuf Salah

EVALUATING RELATIONSHIP BETWEEN DIGITALIZATION AND PUBLIC SERVICE DELIVERY IN PUBLIC UNIVERSITIE

Assignment title

postgraduate

Mount Kenya University

Document Details

Submission ID

trn:oid:::1:3053189287

Submission Date

Oct 24, 2024, 12:41 PM GMT+3

Download Date

Oct 24, 2024, 1:43 PM GMT+3

File Name

YUSUF_IBRAHIM_SALAH_-_FULL_PROJECT_DOCUMENT.doc

File Size

7.1 MB

123 Pages

23,368 Words

144,371 Characters

20% Overall Similarity

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

Exclusions

- 4 Excluded Sources

Match Groups

- **360** Not Cited or Quoted 18%
  Matches with neither in-text citation nor quotation marks
- **26** Missing Quotations 1%
  Matches that are still very similar to source material
- **7** Missing Citation 1%
  Matches that have quotation marks, but no in-text citation
- **0** Cited and Quoted 0%
  Matches with in-text citation present, but no quotation marks

Top Sources

19% Internet sources
4% Publications
8% Submitted works (Student Papers)

Integrity Flags

0 Integrity Flags for Review

No suspicious text manipulations found.

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

Match Groups

- **360** Not Cited or Quoted 18%
  Matches with neither in-text citation nor quotation marks
- **26** Missing Quotations 1%
  Matches that are still very similar to source material
- **7** Missing Citation 1%
  Matches that have quotation marks, but no in-text citation
- **0** Cited and Quoted 0%
  Matches with in-text citation present, but no quotation marks

Top Sources

19% Internet sources
4% Publications
8% Submitted works (Student Papers)

Top Sources

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1	Internet	ir-library.ku.ac.ke 4%
2	Internet	ir.jkuat.ac.ke 1%
3	Internet	erepository.uonbi.ac.ke 1%
4	Student papers	Kenyatta University 1%
5	Internet	ir-library.mmarau.ac.ke:8080 1%
6	Internet	hiiraan.com 1%
7	Internet	repository.kemu.ac.ke:8080 0%
8	Internet	ir.mu.ac.ke:8080 0%
9	Internet	etd.aau.edu.et 0%
10	Internet	cribfb.com 0%