TOWARDS DEVELOPING A FRAMEWORK FOR SUCCESSFUL IMPLEMENTATION OF ELECTRONIC SERVICE IN HIGHER LEARNING INSTITUTIONS OF ETHIOPIA

A THESIS SUBMITTED TO

PARUL UNIVERSITY

FOR THE AWARD OF DEGREE OF

DOCTOR OF PHILOSOPHY (Ph.D.)

IN

IT AND COMPUTER SCIENCE

FACULTY OF IT AND COMPUTER SCIENCE

SUBMITTED BY

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NOVEMBER, 2023

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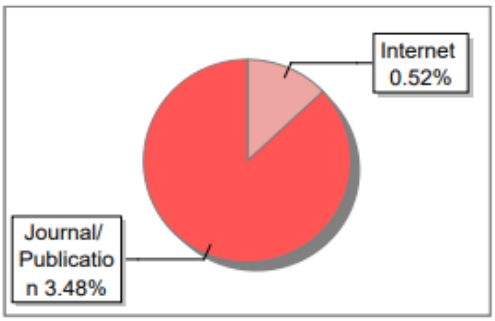

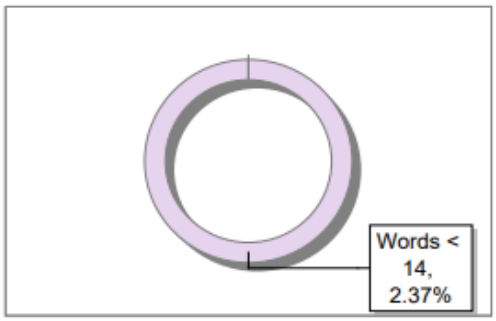

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Hiren Joshi

External Examiner (Name & Signature along with affiliation)

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Report of Final Viva Voce with regard to PhD of DEREJE TEKALEGN BEDAN

A meeting DRC was held on 10/11/2023 in Faculty of IT and Computer Science to evaluate the proposed research work of Mr./Miss/Mrs. DEREJE TEKALEGN BEDAN with Enrollment No: 200500401001, entitled "Towards Developing A Framework for Successful Implementation of Electronic Service in Higher Learning Institutions of Ethiopia"

for the award of the PhD in Faculty of IT and Computer Science

Following members were present in the meeting:-

1. Dr. Hiren Joshi
2. Dr. Parameshachari B.D
3. Dr. Priya Swaminarayan
4. Dr. Abhishek Mehta

The committee members evaluated the presentation of synopsis of the proposed research work under the following points and suggested the comments as under:

Sr. No.	Points	Comments
1	Area of research (Rationale)	Satisfactory
2	Literature work surveyed	Satisfactory
3	Plan of work	Satisfactory
4	Methodology	Satisfactory

Recommendation: Recommended~~/Non-recommended/recommended with suggestions If not recommended (Give reason):~~

Recommend the research work for the award of the Degree of Doctor of Philosophy (Ph.D.) in Faculty of IT and Computer Science

Recommended with suggestions:

Hiren Joshi

DRC Member (1) (Dr. Hiren Joshi)

DRC Member (2) (Dr. Parameshachari B.D)

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ABSTRACT

This study aims to assess the practice, challenges, and prospects of electronic service implementation in higher institutions of Ethiopia. The study employed descriptive and explanatory research design with a mixed research approach. The required data were collected from 364 selected graduate program students by adopting a multistage sampling procedure. With the help of Stata-16 software, the collected data was analyzed using descriptive and inferential statistics. The study's findings showed electronic service implementation has a potential advantage for educational provision regarding flexible access, greater speed, unlimited service time, and accuracy by using technology to assist teaching however, its implementation in higher institutions of Ethiopia had shown limitations. Universities have not been able to demonstrate their ability to implement electronic service delivery to the expected level. Students' electronic service usage capacity, top managerial commitment, information communication technology infrastructure, employee commitment, and training were identified factors affecting electronic service implementation. On the other hand, electronic service delivery has prospects to improve knowledge, innovation, and service quality. Thus, there is a need to put a higher effort to facilitate the full implementation of service delivery by improving top management commitment, providing training for staff and students, improving information communication technology infrastructure, and developing students' electronic services usage capacity. Further, Implementation Framework for the successful Implementation of E-Service has been developed and evaluated empirically within the context of higher learning Institutions of Ethiopia.

Keywords: Ethiopia, Electronic Service Implementation, Higher Institution, Students

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LIST OF ABBREVIATIONS AND ACRONYMS

ESI	E-Service Implementation
FDRE	Federal Democratic Republic of Ethiopia
FMCITE	Federal Ministry of Information and Communication Technology of Ethiopia
ICT	Information Communication Technology
ICT4D	Information Communication Technology for Development
MITE	Ministry of Innovation and Technology of Ethiopia
MOE	Ministry of Education
MOSHE	Ministry of Science & Higher Education
ESDI	Electronic Service Delivery Implementation
HLI	Higher Learning Institutions

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CHAPTER 1: INTRODUCTION

1.1. Background of the Study

In the contemporary era, Electronic Service Implementation (ESI) emerges as a pivotal catalyst propelling the waves of globalization and advancement. This dynamic facet has evolved into a formidable wellspring of innovation, catalyzing the enhancement of organizational service provisioning. Its transformative potential is far-reaching, permeating every facet of goal attainment and customer contentment in the current landscape. By orchestrating a metamorphosis from conventional service delivery methods to a progressive and modernized approach, ESI has emerged as a linchpin in reshaping the service paradigm. The imperatives for E-service implementation are underscored by the imperatives for enhanced velocity and precision in service provision, thereby cultivating an environment primed for heightened efficiency and customer satisfaction (Rahman & Ahmed, 2014).

As elucidated by Taherdoost et al. (2015), the concept of E-Service encapsulates the offering of interactive, content-centric, and electronically driven services across digital networks. Building upon this, Kvasnicova et al. (2016) further expound that Electronic-based service encompasses services facilitated through the deployment of information communication technologies. Collectively, these scholarly perspectives delineate E-Service as a dynamic domain that not only spans interactive and content-rich provisions but is fundamentally rooted in the seamless integration of electronic platforms and information communication technologies.

The term "e-service" comprises two distinct components: the "e-" and the "service," each embodying separate dimensions. The prefix "e-" signifies the electronic nature of the endeavor, implying that activities are conducted through digital means and can be associated with

electronic artifacts. Conversely, the term "service" embodies a realm of intangibility, reflecting a process wherein value is crafted for individuals. This duality underscores the synthesis of electronic functionality and the intangible process of value creation, encapsulating the essence of "e-service" as an amalgamation of technological prowess and intangible service delivery, transcending the physical to cater to the experiential and digital dimensions (Taherdoost et al., 2015).

As elucidated by Ground and Horn (2004), a transformative trend has been observed since the early 1990s, wherein numerous governments across the globe have embraced and executed E-Services solutions spanning a spectrum from basic web-based establishments and unilateral communication to interactive bidirectional communication and intricate transactions encompassing a diverse spectrum of stakeholders, including citizens and businesses. This trajectory in government evolution transitioned from the rudimentary stages of web presence and one-dimensional interaction to an elevated phase characterized by seamlessly integrated web interfaces and a surge in e-participation, reflecting a comprehensive and dynamic shift toward holistic electronic engagement that extends beyond the surface to foster multifaceted interactions and synergies between government bodies and the wider populace.

In Ethiopia, the implementation of e-services in higher educational institutions signifies a pivotal stride towards modernization and enhanced efficiency in the realm of education. Ethiopia's adoption of e-services within its higher education sector underscores the nation's commitment to embracing cutting-edge digital solutions to address educational challenges and meet the evolving needs of students, faculty, and administrative staff. This comprehensive transformation encompasses diverse facets, ranging from the digitization of administrative processes to the integration of advanced e-learning platforms, and from streamlined online registration systems to

real-time communication channels that bridge geographical gaps. The impact of this implementation resonates on multiple levels, fostering greater accessibility to educational resources, transcending traditional classroom boundaries, and enabling remote learning opportunities, thereby democratizing education and promoting lifelong learning (Saidhbi, 2012).

Additionally, e-services facilitate streamlined administrative operations, expediting tasks such as transcript requests, fee payments, and course registration, reducing bureaucratic hurdles, and enhancing the overall educational experience. However, this transformation also brings forth challenges that must be addressed, including issues of digital divide, data security, and the need for comprehensive technical support. As Ethiopia's higher educational institutions navigate this intricate terrain, collaboration between stakeholders, a commitment to robust digital infrastructure, and continuous adaptation to the ever-evolving technological landscape are vital components that will pave the way for an e-service-enabled educational ecosystem that empowers learners, fosters innovation, and positions Ethiopia on the global map of technologically advanced education (Hiran et al., 2018).

Thus, the study was conducted to develop a framework for the successful implementation of electronic services in higher learning institutions in Ethiopia.

CHAPTER 2:REVIEW OF RELATED LITERATURE

2.1. Introduction

In this chapter, a comprehensive exploration unfolds, shedding light upon a plethora of studies orchestrated by diverse researchers within the field. With a focal point on E-service implementation, a tapestry of intricate concepts and theories is meticulously elucidated, unravelling the very essence of this domain. This intellectual voyage not only disseminates a reservoir of empirical literature, but also artfully constructs a conceptual framework firmly rooted in the bedrock of the research objectives. Through this tapestry of knowledge, the chapter seamlessly weaves together the threads of scholarly endeavor, offering readers a panoramic view of the multifaceted landscape of E-service implementation.

2.2. Conceptual Literature

2.2.1. E-service

A service, as encapsulated by its definition, emerges as a dynamic and indispensable system geared towards fulfilling the essential requisites of the public, meticulously orchestrated either by the discerning hand of the government or the nimble mechanisms of a private enterprise, as succinctly noted by Hornby (2010). Within this definition resonates the inherent recognition of its dual nature, bridging the realms of public welfare and organizational acumen, thereby underscoring its pivotal role in catering to the diverse and ever-evolving needs of society.

E-service, encompassing a digital dimension, emerges as a distinct genre within the realm of services, facilitated through internet-based applications, as elucidated by Tiwana and Balasubramaniam (2001). This virtual conduit introduces a paradigm shift, transcending

conventional boundaries to meet the demands of an increasingly interconnected world. Furthermore, the landscape of E-service delivery unfurls a diverse tapestry of interpretations, framed by a multitude of scholars spanning the global academic spectrum, each imbuing this concept with unique definitions and conceptual frameworks, thereby encapsulating its multifaceted nature and global significance.

As articulated by Taherdoost et al. (2015), the essence of E-Service crystallizes into a definition that encapsulates its multifaceted nature: the provision of services that are inherently interactional and content-centered, orchestrated through electronic-based platforms and seamlessly disseminated over expansive electronic networks. This encompassing interpretation not only underscores the intricate interplay of technology and human interaction but also underscores the pivotal role of electronic networks as conduits for the delivery of services in the digital age.

Highlighted by Kvasnicova et al. (2016), the terminology of "Electronic based service" crystallizes as a service harnessed through the intricate web of information communication technologies, thus forging an integral connection between service provision and the digital landscape. Building upon this foundation, these scholars expound that the term "E-Service" transcends disciplinary confines, resonating across diverse domains, and sparking multifarious applications. Collectively, the corpus of definitions furnished by preceding researchers converges to delineate a unifying essence: E-service manifests as the provision of a spectrum of services artfully facilitated through the medium of internet-based applications and a gamut of electronic channels, standing as a testament to the evolving dynamics of service delivery in the digital age.

2.2.2. Characteristics of E-service

Characteristics of E-service encompass its digital nature as an internet-based technical artifact intricately linked to information systems. It's defined by its intended use and users, demanding attention to accessibility and usability aspects for effective engagement. This dynamic interplay underscores the importance of designing E-services that cater to diverse user groups and provide seamless navigation, cultivating an environment where technology harmonizes with human-centric values. In alignment with the insights of Scupola et al. (2009), the distinguishing facets of E-service materialize as a technical artifact imbued with the essence of the internet, intricately interwoven with a network of interconnected information systems. This depiction underscores the fundamental attributes that not only define the nature of E-service but also emphasize its technological underpinnings, positioning it as a dynamic and interconnected entity that seamlessly navigates the digital landscape while being intricately linked to broader technological infrastructures.

In this context, a comprehensive comprehension of E-service necessitates an examination in tandem with its intended purpose and the users it seeks to serve. This perspective accentuates the significance of factors such as accessibility and usability, encapsulating pivotal dimensions that wield a substantial impact on the efficacy and reach of E-service, as underscored by Askari et al. (2016). These considerations shed light on the intricate interplay between design, functionality, and user experience, resonating as crucial touchstones for the seamless integration and effectiveness of E-service within the digital realm.

2.2.3. Benefits of E-service

E-service implementation transcends conventional boundaries, ushering in a myriad of benefits that resonate across citizens, businesses, and government entities alike. This transformative approach facilitates round-the-clock access to organizational information for individuals, enterprises, and public sectors, elevating the standard of service provision by ensuring continuous availability. Beyond accessibility, E-service implementation wields the potential to streamline and optimize organizational processes, leading to cost reduction and enhanced operational efficiency. By harnessing E-service systems, government agencies are poised to witness an overhaul in their performance metrics, with the capacity to deliver public services with unparalleled effectiveness and efficiency, thereby catering to a diverse clientele. The extensive advantages of E-service extend further, encompassing the realm of government service operations through optimized resource allocation, reduced transactional overheads, augmented transparency, and an expanded array of services for citizens, as highlighted by Solinthone and Rumyantseva (2016). In essence, the comprehensive integration of E-service not only redefines service delivery but also brings forth a paradigm shift in governance, ushering in an era of enhanced accessibility, efficiency, and citizen-centric operations.

Aligned with the insights of Alshehri and Drew (2010), the significance of E-service unfurls as a transformative conduit with far-reaching implications, resonating in the realms of both service seekers and providers. By diminishing temporal, physical, and financial barriers, E-service emerges as a potent catalyst in optimizing the service consumption process, trimming down inefficiencies, and curbing costs for individuals and organizations alike. Beyond mere expedience, its imprint on service delivery and customer satisfaction is profound, encapsulating an avenue for unparalleled enhancement. E-service's role in fostering good governance practices

stands as a testament to its potential to reconfigure the dynamics of citizen interaction with government bodies, fostering transparency and accountability. Furthermore, the transformative potential of E-service extends to galvanizing economic landscapes, nurturing the birth of novel businesses, and redefining established ventures by virtue of streamlined information dissemination. This culminates in a synergistic ecosystem where efficiency and effectiveness thrive, facilitated by real-time data sharing across a singular database, effectively harnessing the power of simultaneous engagement by all service seekers. In essence, Alshehri and Drew's exposition accentuates the multifaceted dimensions of E-service, underscoring its pivotal role in reshaping traditional paradigms and propelling a landscape where convenience, satisfaction, efficiency, and innovation converge.

Drawing on the insights of Alshehri and Drew (2010), the multifaceted significance of E-service unfolds as a transformative force with profound implications spanning across service seekers and providers. Beyond the confines of traditional service models, E-service emerges as a catalyst for change by circumventing temporal, physical, and financial barriers, ushering in a paradigm of heightened efficiency. This seismic shift not only expedites processes but also mitigates the burdens of effort and cost for both individuals and organizations. Moreover, E-service becomes a lodestar in the quest for service enhancement, casting its influence upon the domains of delivery and customer satisfaction, cultivating an atmosphere where quality is paramount. Beyond the immediate impact, its role in nurturing good governance practices becomes evident, enshrining transparency and accountability within its digital framework. E-service, however, does not confine its influence solely to optimization; it extends its embrace towards fostering novel enterprises, leveraging its power to share real-time information across a unified database, thus nurturing an ecosystem where innovation flourishes. In essence, Alshehri and Drew's perspective

eloquently paints E-service as a cornerstone of progress, a conduit that not only redefines the dynamics of engagement but also propels the convergence of convenience, satisfaction, efficiency, and innovation into the heart of modern service paradigms.

2.2.4. E-service implementation

As underscored by Ground and Horn (2004), a transformative trajectory has unfurled from 1990s, witnessing governments across the globe embracing and operationalizing electronic services that span a spectrum of functionalities. This progressive evolution encompasses a spectrum of digital interventions, traversing from rudimentary web-based platforms enabling one-way communication, to more sophisticated arenas fostering dynamic two-way interactions and transactions with a diverse array of stakeholders, encompassing citizens and businesses alike. This epoch of governmental transition gradually shifted towards a paradigm characterized by a heightened integration of web presence, laying the foundation for enhanced e-participation. In this dynamic landscape, E-Services have emerged as a fulcrum of change, orchestrating the metamorphosis of traditional governance frameworks into interconnected and participatory platforms that resonate with the contemporary digital era.

Numerous scholars have endeavored to unravel the intricacies of E-Services implementation through an evolutionary lens, delineating the developmental journey into distinct stages, a perspective notably expounded by researchers like Moon (2002) and Layne & Lee (2001). This strategic approach, reflected in the transition from nascent to mature stages, encapsulates the dynamic process of E-Services evolution, marking a trajectory characterized by continuous refinement and growth. The concept of maturity, denoting an advanced state, resonates as a pivotal pivot point, as elucidated by Anderson (2004), where the emphasis shifts from fledgling stages towards a seamlessly integrated and fully functional E-Services delivery infrastructure.

This evolutionary path, however, is not devoid of organizational and technological challenges. As underscored by Irani et al.(2006), the electronic services paradigm embodies a rich tapestry interwoven with multifaceted issues that span both the organizational and technological spheres. It necessitates not just surface-level adaptations but profound reconfigurations that penetrate the core of institutions and their constituents, culminating in a transformed landscape of public administration and service delivery. In this tapestry of research, the concept of E-Services reverberates as an intricate and fertile realm that encapsulates an amalgamation of intricate organizational dynamics and technological innovations.

While the incorporation of maturity or immaturity may offer a structured lens for understanding E-Government, it doesn't inherently strengthen the conceptual framework underpinning it. Hassan et al. (2011) emphasize a critical point - the need for qualitative and/or quantitative metrics that can effectively discern the nuances distinguishing varying degrees of maturity. This echoes the sentiments of researchers like Olatokun and Adebayo (2012), who emphasize the indispensable requirement of robust measures to assess the evolution of E-Services stages. As elucidated by the latter, the staged approach holds a unique advantage in its capability to generate momentum that can be sustained over time. This momentum is pivotal, as it can serve as a catalyst to progressively draw an expanding populace, including citizens, into embracing and utilizing E-Services within the public sector. In essence, the staged progression not only facilitates the systematic enhancement of E-Services infrastructure but also nurtures a burgeoning user base, thereby fostering a symbiotic growth between technology and its adoption in the realm of public services.

The intricate process of E-Services implementation is characterized by a transformative journey through a series of distinct stages, each imbued with its own significance and challenges. This

progressive evolution culminates in the highest echelon, a state of optimal functionality marked by the seamless amalgamation of institutional data and information across diverse governmental departments, functions, and hierarchical levels. This holistic convergence empowers citizens with an unprecedented avenue to access a comprehensive array of government services and information through a singular online gateway, as underscored by the insights of Sharma & Gupta (2003). Illuminating the expansive terrain of e-government disciplines, the scholarly landscape resonates with a multitude of stage models, meticulously crafted by researchers ranging from individual academics to esteemed institutions. These models stand not just as blueprints but as a collective testament to the persistent exploration of E-Services' developmental trajectory, bridging the realms of technology, governance, and public service delivery while encapsulating the iterative and interdisciplinary nature of e-government research.

2.2.5. Growth model of E-service implementation

In a sweeping global transition, organizations both private and public, spanning continents and sectors, are embracing the transformative potential of E-Services delivery solutions. This profound shift traverses a spectrum that spans from fundamental web-based interfaces, laying the foundation for basic one-way communication, to the more intricate tapestry of two-way interactions and sophisticated transactional capabilities with a wide array of stakeholders. This transition is substantiated by the scholarly works of Abdulbaqi (2014), Bhandari (2014), and Haque (2012), all of which underscore the widespread adoption of E-Services across organizational landscapes. Within this dynamic transformation, the process of E-Services delivery implementation unfolds as a multifaceted voyage, encompassing a sequence of discernible stages, each pivotal in shaping its evolution. As we venture further, this section embarks on an in-depth exploration of these transformative stages, derived from an extensive

tapestry of literature, thus encompassing the diverse perspectives that converge to intricately outline the path and progress of E-Services delivery implementation in an ever-evolving digital era.

The growth model pioneered by Janssen and Van Veenstra (2005) emerges as a potent tool that holds the potential to empower public managers in shaping coherent strategies to propel their organizational objectives forward. Furthermore, this model finds utility as a compass, guiding public decision-makers in navigating the intricate landscape of architectural development. In the context of E-Services implementations, the growth model's applicability shines particularly bright, serving as a framework to streamline the often complex trajectory of progression. What sets the growth model apart is its intrinsic nature as a learning-oriented paradigm, where the stages of implementation are intricately woven with the interplay of diverse factors. This inherently adaptable structure, grounded in a holistic understanding of contextual nuances, distinguishes the growth model from alternative frameworks, positioning it as a dynamic and informed approach that resonates with the evolving nature of E-Services implementation.

The implementation of e-services has several stages. The stages of e-service implementation refer to the levels of website development in providing services. In this regard literature found to vary in using the stages terminology and contents that should be concluded in each (Alshehri & Drew, 2010). The common growth model of E-service implementation which was developed by different scholars was listed as follows:

2.2.5.1. Three Stage Model

The groundwork laid by preceding researchers, including Al-Shafi (2009), Bhatangar (2004), and Howard (2001), has borne fruit in the form of a three-stage model meticulously crafted for the

realm of electronic service implementation. This tripartite framework stands as a testament to their collective insights, encapsulating a structured progression that unveils the journey of electronic service integration. The amalgamation of these diverse perspectives converges to outline a cohesive roadmap, ushering organizations through the critical stages of harnessing technology to enhance service delivery and customer engagement.

Stage 1: Publish

In the landscape of e-government, the concept of "Publish" denotes an initial stage that offers a diverse array of implementations, each uniquely designed and laden with content. For developing nations, this stage emerges as a pivotal starting point in the journey towards establishing a robust e-government framework. At its core, this stage revolves around the dissemination of government information through online channels. The process begins by making available a range of documents, including rules, regulations, official documents, and forms, accessible to the public through digital platforms. This foundational step heralds a transformation in the accessibility of information, allowing citizens and stakeholders to engage with crucial governmental resources from the convenience of their digital devices. This approach not only fosters transparency but also cultivates an environment of informed citizenry. By pioneering the publication of such essential resources, developing nations lay a cornerstone for subsequent stages, setting in motion a trajectory that can lead to more advanced e-government functionalities.

Stage 2: Interact

The "Interact" phase within the e-government landscape encapsulates a pivotal paradigm shift, harnessing the transformative potential of technology to foster active citizen participation within the governance process. This stage, characterized by dynamic two-way interactions, unfolds as a

platform for citizens to engage directly with policymakers across various stages of the policy cycle and governmental hierarchies. The essence of this phase lies in its power to democratize the decision-making process, enabling citizens to voice their concerns, offer insights, and collaborate in shaping policies that directly impact their lives. Beyond being a mere conduit, this interactive e-government approach becomes a beacon of inclusivity, propelling civic engagement to the forefront. The result is twofold: not only does it bolster public trust by facilitating a more transparent and responsive governance structure, but it also nurtures a sense of ownership and shared responsibility among citizens, effectively transforming them from passive spectators to active stakeholders in the governance discourse.

Stage 3: Transact

"Transact" signifies a paradigm shift in e-government, where governments extend their digital reach by establishing online platforms that facilitate transactions conducted by users. This stage represents a pivotal advancement, as it empowers citizens and businesses with the ability to engage in a myriad of governmental activities and services through digital channels. The significance of this phase is underscored by a multitude of drivers, including the potential for substantial cost savings achieved through streamlined processes, enhanced accountability facilitated by comprehensive information logs, and productivity gains for both citizens and government entities. This transformative leap not only expedites processes, reducing the time and effort invested in traditional in-person transactions, but also enhances convenience, accessibility, and efficiency. The "Transact" stage of e-government crystallizes the realization of digital empowerment, where the boundary between government and constituents is transcended by a seamless digital interface, ultimately contributing to a more agile, accountable, and service-oriented governance landscape.

2.2.5.2. Four Stage Model

The diligent efforts of earlier researchers, including Gatner (2003) and Baum and Di Maio (2000), have borne fruit in the form of a comprehensive four-stage model meticulously crafted for the domain of electronic service implementation. This quadripartite framework stands as a testament to their collective insights, elucidating a structured progression that delineates the journey of integrating electronic services. By amalgamating these diverse perspectives, a coherent roadmap emerges, guiding organizations through the pivotal stages of leveraging technology to enhance service delivery, streamline processes, and enrich citizen engagement.

Stage 1: Web Presence

This initial stage is characterized by the establishment of a basic, passive information-providing website, often referred to as "brochure ware," denoting its similarity to static paper brochures. At this level, the digital platform serves as a repository of unchanging content, offering no personalization features or dynamic interaction. This stage embodies the simplest and most cost-effective foray into E-Service implementation, although it also offers the most limited array of options for citizens. In this scenario, citizens encounter a rudimentary website that showcases elementary data about an institution, such as operational time, sending address, and contact numbers. However, the website lacks interactive features, rendering it akin to an online informational leaflet, with no mechanisms for dynamic engagement or personalized interaction.

Stage 2: Interaction

The second stage in electronic service implementation advances to "interaction," where the digital landscape extends beyond information dissemination to encompass digital communication and the transformation of information. While this phase introduces more dynamic capabilities, initiatives within this bracket are still somewhat constrained in terms of their potential to fully

streamline and automate government processes. The interactions within this stage tend to be relatively straightforward, primarily focusing on the provision of information. In essence, the aim is to offer citizens a means to access commonly sought information and forms at any time, thereby reducing the necessity for in-person visits or phone calls. This realm of resources may include guidelines for availing services, downloadable forms for printing and mailing to agencies, or even email contact for addressing basic inquiries. The "interaction" stage serves as a bridge, facilitating uncomplicated interactions spanning government-to-citizen (G2C), government-to-business (G2B), and government-agency-to-government-agency (G2G) interactions. A prime example of this stage could be customers' inquiries through email, illustrating a transition towards more dynamic engagement avenues.

Stage 3: Transaction

The third stage in the evolutionary trajectory of E-Services initiatives marks the transition to "transaction," signifying a leap into more sophisticated realms. This phase encapsulates services that encompass online transactions and back-office integration, representing a notable advancement from the previous stages. Initiatives within this category are inherently more intricate, moving beyond mere information provision to embody the essence of e-government activities. These endeavors empower customers to accomplish complete jobs electronically, irrespective of the time, essentially creating self-service mechanisms that cater to diverse needs. Notable examples include online license renewals, tax and fee payments, as well as the submission of bids for procurement contracts. The hallmark of this stage is the establishment of two-way interactions, although the flow of information remains primarily one-directional, either from the client to the government or vice versa, depending on the nature of the activity. Electronic responses within this context are typically highly standardized, resulting in predictable

outcomes. At the "transaction" stage, the realm of possibilities expands to encompass activities like online payment for license renewals, taxes, fees, and the electronic submission of bids for procurement contracts, culminating in an enriched landscape of digital service delivery.

Stage 4: Transformation

The pinnacle of E-Service evolution is encapsulated in the "transformation" stage, representing a radical paradigm shift that harnesses technology's full potential to revolutionize the conception, organization, and execution of government functions. Initiatives at this advanced level encompass robust customer relationship management capabilities, enabling the seamless handling of a diverse spectrum of queries, concerns, and requirements. One of the defining characteristics of these initiatives is their ability to foster the unfettered flow of information and collaborative decision-making among federal, state, local, public, and private partners. This entails dismantling traditional organizational barriers that perpetuate agency-centric approaches, in favor of customer-centric solutions. In the most ambitious instances, transformative e-Government initiatives might even envisage the reorganization, consolidation, or elimination of existing agencies, paving the way for the emergence of virtual organizations.

This highest stage, tightly intertwined with the concept of governance, encompasses a profound reimagining of how government functions are conceptualized and structured. It goes beyond mere transactional processes and embraces a holistic approach that redefines the very essence of governance. At this zenith, online two-way interactions flourish between citizens and government entities, enabling the fruition of seamless and continuous communication. This includes an array of capabilities such as tax payment, the application for ID cards, birth certificates, passports, license renewals, and other similar citizen-to-government interactions. The hallmark of this stage is the empowerment of individuals to engage in these

activities online, 24/7, transcending temporal and geographical limitations. In essence, the "transformation" stage marks the zenith of E-Service implementation, harnessing technology's transformative prowess to reshape the dynamics of governance and service delivery.

2.2.5.3. Five Stage Model

The five-stage model aims to address limitations in the Layne and Lee (2001) framework and encompasses initiatives to overcome barriers in citizen participation. These initiatives encompass bridging the digital divide, encouraging citizen engagement, and fostering trust in e-government services. Trust-building becomes crucial, especially given issues like corruption. This model proposes an additional "interaction" stage, responding to digital divide and trust challenges, positioned after the cataloguing stage. Notably, this model presupposes prerequisites such as political commitment, robust IT infrastructure, legal framework, citizen-oriented approach, and government guidance.

Stage 1: Cataloguing Stage

In this initial stage, the government embarks on the endeavor of establishing a digital presence, laying the foundation for an informational website that serves as a repository of government-catalogued information, thereby enabling citizens to access a range of pertinent data online. This includes information both about the government itself and information generated by governmental processes. Through this step, government agencies initiate their journey into the realm of online transactions, simultaneously initiating the process of e-literacy training for their staff. The presence of this informational hub equips citizens with the tools to discern the steps required to access specific government services, fostering a sense of clarity in navigating the bureaucratic landscape. This stage is not without its technical complexities, particularly in the management and design of information access for e-government. Dawes et al. (2004) offer a

comprehensive framework outlining considerations for designing such information access, spanning from public policy objectives and problem analysis to data management, organizational dynamics, and user needs. Moreover, this stage lays the groundwork for tracking shifts in citizen behavior as e-government develops further, offering invaluable insights for enhancing government services. Alongside the establishment of government websites, information cataloguing, provision of contact details for officials, and availability of specific information about services and downloadable forms emerge as key components. It is prudent, however, to exercise discretion in the services offered online at this juncture, focusing on those that are simpler to provide electronically, cost-effective, and more likely to be accessed digitally by users. Developers initiate the process by disseminating information about these chosen services, which may be offered partially as a precursor to complete provision. While acknowledging that not all government services can be fully digitized at this stage, the strategy involves commencing partial and incomplete provisions, with the intent to progressively complete them in subsequent stages. In regions where multiple languages are spoken, a strategic move involves inaugurating this stage with the creation of a bilingual or multilingual government website, setting the stage for the subsequent phase that fosters user interaction.

Stage 2: Interaction Stage

Fostering citizen participation in e-government development stands as a pivotal determinant in the success of the entire e-government endeavor. The initial stage, characterized by the provision of government information online in specific formats, underscores the imperative of citizen awareness in shaping their engagement with the evolving system. This awareness assumes a central role, facilitated by media outreach, in cultivating citizen interaction with the burgeoning electronic government landscape. Notably, the significance of citizen involvement cannot be

understated; their participation is the cornerstone upon which the very concept of e-government hinges. By actively involving citizens in the developmental process, a crucial foundation for building public trust in government is laid.

Furthermore, this stage necessitates a reexamination of governance processes. Traditional pathways for accessing electronic government services can be arduous and perplexing for the average citizen. In many cases, the existing procedures are prone to complexities and may even foster bribery and a loss of governmental accountability. This calls for a process reengineering that strives to replace outdated methods with more streamlined and comprehensible approaches. Simplicity, cost-efficiency, and a reduction in opportunities for corruption become the driving forces behind this restructuring.

However, this stage is not without its challenges. Overcoming the digital divide emerges as a significant hurdle, necessitating the enhancement of IT infrastructure, comprehensive citizen education, and the establishment of information kiosks in rural areas. To surmount these barriers, it is crucial to underscore the effectiveness of citizens' contributions, underscored by transparent governmental procedures that facilitate comprehension.

Successful implementation mandates strategies for encouraging and empowering citizens and businesses to actively engage with the electronic services extended by the government. Incentives could range from faster processing of online inquiries to discounted charges for services obtained digitally. Certain services might even be exclusively accessible through digital means, promoting electronic interaction.

A holistic perspective encompasses considerations of usability and the education and training needs of users. Facilitating user-friendly interaction requires measures such as offering online

training courses and ensuring consistency in website formats. In sum, this pivotal stage highlights the vital interplay of citizen participation, simplified processes, technological empowerment, and transparent communication to shape the trajectory of e-government's success.

Stage 3: Communication stage

In this stage, the government embarks on establishing electronic communication channels with its stakeholders within the realm of e-government. This phase entails both one-way and, in specific cases, two-way electronic communication, but not all forms of communication are encompassed at this stage. For instance, while emails enable dual-directional exchanges between citizens and government officials, technical and legal limitations inhibit the electronic submission of official forms, which necessitate physical signatures. The minimum requirement for this stage is the provision of one-way communication from government to stakeholders. The spectrum of stakeholders comprises citizens (G2C), businesses (G2B), and government entities (G2G). The primary technical challenge revolves around enriching informational websites with more features to enhance communication channels. Leveraging electronic mail for communication is pivotal in this stage. Notably, the government introduces downloadable forms on its website, enabling citizens to complete necessary paperwork prior to engaging with government offices. These completed forms can subsequently be submitted via post or in person, significantly streamlining processes for all parties involved.

User feedback becomes a potent tool for service enhancement in this stage. By tracking the most visited web pages and users' browsing patterns, government agencies can tailor their efforts to specific areas, optimizing resource allocation. However, this practice raises concerns about privacy and trust, emphasizing the need for stringent safeguards (Layne and Lee, 2001). Reddick (2004) highlights that this stage often takes longer than anticipated, emphasizing the importance

of explicit measures to ensure privacy protection. Furthermore, indicators for this stage can encompass any form of one-way electronic communication beyond officials' emails.

This stage serves as a precursor for the automation necessary for the subsequent phase. It kick starts the process of government officials engaging with citizens electronically, thereby streamlining service procedures and curtailing corruption. Yet, the transformational process faces resistance due to entrenched methods and practices. Overcoming this requires educating and training staff, involving them and other stakeholders in system development, implementing performance measurements and incentives, and securing the commitment of top management to drive change acceptance among end users.

Stage 4: Transactional stage

This stage embodies a heightened level of maturity compared to its predecessor, facilitated by two-way communication channels that extend beyond the previous stage. Here, each government agency takes center stage in providing services to both citizens and businesses, ushering in a comprehensive realm of electronic transactions. This stage marks a paradigm shift wherein stakeholders are empowered to engage in electronic exchanges with government entities (C2G, B2G, and G2G), a significant leap from the preceding phase's one-way communication. Crucially, transactions are now conducted entirely through digital avenues. For instance, processes like obtaining building permissions entail stakeholders downloading electronic forms, completing them, and transmitting the forms and requisite documents to the relevant authorities electronically. Subsequently, an 'electronic' building permission is issued at day's end. It's important to note that while these services are limited compared to the broader functionalities of specific government agencies, the transformative potential remains immense.

For instance, if a citizen requires interaction with multiple agencies to secure a business license, online facilitation for such multi-agency endeavors is yet to be fully realized. Nevertheless, various transactions manifest within this stage, exemplified by actions like renewing driving licenses, electronically completing tax forms, and effectuating tax payments. A paramount technical challenge entails provisioning robust database management systems to underpin online transactions, coupled with the installation of robust security mechanisms. Overcoming authorization and authentication challenges assumes critical significance in this phase. In developing countries, the additional hurdle of establishing online transaction capabilities and direct government service links requires meticulous attention. Moreover, a pivotal component involves revising and enhancing the legal framework to seamlessly accommodate online transactions, a transformation that inherently addresses concerns of privacy and trust. This unmediated approach enables direct interaction and transactions with each agency. The upshot is a considerable saving of time and costs for users, exemplified by streamlined financial transactions and the electronic transmission of official forms and documents. In essence, the "Transaction" stage represents a pivotal milestone where the government's digital evolution yields concrete benefits to citizens and businesses alike.

Stage 5: Integration stage

The pinnacle of e-government evolution, the "Integration" stage marks the convergence of all governmentagencies into a unified ecosystem accessible via a single central e-government portal. Users gain the unprecedented ability to avail themselves of all government services online, streamlined through this singular gateway. The typology delineated by Layne and Lee (2001) distills integration into two distinct sub-stages, each bearing unique attributes. The first phase, "vertical integration," interconnects local, state, and federal systems sequentially, forging a

seamless continuum. Notably, this integration surfaces where agency functionalities are akin. To illustrate, consider the interlinking of local, state, and federal judicial systems. This alignment permits the cross-jurisdictional access of crime records, allowing a crime committed in one state to be accessed by the judicial systems of others. Another example elucidates the renewal of a driving license across different states, a feat enabled through nationwide police system interconnections.

Concurrently, the second phase tackles the interconnection of dissimilar government agency systems, each endowed with unique functionalities. The primary challenges encompass managing intricate databases across disparate agencies while safeguarding user data confidentiality. Upholding consistency in format and user-interface across varied agencies further complicates matters. Yet, these challenges can be circumvented through multi-agency partnerships, not only ensuring cost-effectiveness but also cultivating collaborative solutions. Notably, this stage's role mirrors the aggregator business model (Mousavi et al., 2007), akin to a one-stop shopping experience. Here, the principle is transposed to the realm of governance, manifested as a one-stop government framework. The culmination of this stage heralds the realization of e-government's ultimate national objective, wherein all stakeholders luxuriate in the benefits of comprehensive one-stop government services, propelling the nation into a new era of digital governance.

2.2.5.4. Six Stage Model

Certainly, the foundational works of Deloitte and Touche (2001) as well as the contributions of Irani et al. (2006) have yielded a comprehensive "Six Stage Model" for the implementation of electronic services. This model endeavors to encapsulate the intricate journey of electronic service evolution, offering a holistic framework that delineates the stages of development with an

underlying understanding of the intricate dynamics at play. While the specific details of these stages may vary, the general trajectory is guided by the comprehensive wisdom these researchers have amassed. Their collective insights provide a roadmap for institutions and governments to navigate the multifaceted landscape of electronic service provision, fostering advancements that align with contemporary technological landscapes while also acknowledging the complexities and challenges unique to each stage.

Stage 1: Information Publishing

The initial stage of electronic service implementation entails "Information Publishing/Dissemination." Here, governments embark on the path of enhancing user access to vital information. This stage underscores the foundational importance of transparency and accessibility, as the government takes steps to make pertinent information readily available to users. Through this, citizens gain greater insight into government operations, policies, and services, fostering a more informed and empowered populace. This preliminary stage serves as the bedrock upon which subsequent phases of electronic service evolution are built, laying the groundwork for more complex interactions and transactions in the pursuit of comprehensive digital governance.

Stage 2: Official Two way Transaction

This stage embodies a profound shift in the landscape of e-governance. Building upon the initial stages of information dissemination, this stage represents a transformative leap towards dynamic interactions between government bodies and users, orchestrated through the adept utilization of cutting-edge information and communication technologies. At this juncture, the integration of tools such as digital signatures and security keys ushers in a new era of secure and robust interactions. Digital signatures authenticate the identity of both parties engaging in the

transaction, infusing an element of trust and credibility into the proceedings. This cryptographic technique not only verifies the origin and integrity of electronic messages but also validates the authenticity of the sender, thereby mitigating the risks associated with fraudulent activities.

In parallel, the deployment of security keys fortifies the transactional ecosystem. These cryptographic devices provide an additional layer of protection, enabling encrypted communication that shields sensitive information from unauthorized access. The amalgamation of digital signatures and security keys forms an impregnable shield against data breaches and cyber threats, fostering a secure environment in which governmental entities and users can confidently engage.

Within this stage, the interaction takes on a reciprocal nature. Users are empowered to not only access government information but also actively participate in a dialogue, transmitting inquiries, requests, and feedback to government bodies. Conversely, the government responds with personalized and tailored solutions, further enhancing user experiences. This two-way exchange streamlines processes, reduces bureaucratic hurdles, and significantly expedites service delivery. Moreover, it nurtures a symbiotic relationship, instilling a sense of involvement and empowerment within citizens, while government agencies gain real-time insights into public sentiment, enabling them to adapt policies and strategies accordingly.

The incorporation of digital signatures and security keys attests to the maturation of e-governance, signifying a commitment to safeguarding the confidentiality, integrity, and authenticity of transactions. This stage represents a cornerstone for the subsequent phases of electronic service evolution, laying the groundwork for more intricate and transformative advancements in the realm of digital governance. As governments continue to harness the potential of information and communication technologies, this stage stands as a testament to the

convergence of innovation, security, and user-centricity, shaping a future where electronic interactions are not only seamless but also fortified against the challenges of the digital age.

Stage 3: Multi-purpose Portals Stage

This stage signifies a notable stride in the evolution of digital governance. Building upon the foundations of previous stages, this phase ushers in a paradigm shift, as governments harness the power of consolidation and synergy by employing a singular portal to extend universal services across an array of diverse departments. This stage is emblematic of a pivotal transformation where the government transcends silos and departmental boundaries, forging a cohesive digital landscape. By amalgamating services from multifarious departments under the umbrella of a single portal, citizens and businesses gain unprecedented convenience, accessing an array of services through a unified entry point. This seamless convergence mitigates the need for users to navigate disparate websites and interfaces, streamlining their interactions and enhancing user experiences manifold.

The multi-purpose portal embodies the principles of efficiency, effectiveness, and user-centricity. It eliminates redundancies, simplifies processes, and harmonizes the user journey. Whether individuals seek services from healthcare, education, taxation, or any other domain, the portal becomes the nucleus of their interactions, eliminating the need for multiple logins and disjointed procedures. This consolidation catalyzes time and cost savings, while also augmenting user satisfaction through a coherent and user-friendly interface. Yet, beneath the surface of this transformative leap lies a myriad of complexities. The integration of services across different departments necessitates harmonizing varying systems, data structures, and protocols. Ensuring interoperability, data security, and seamless navigation becomes paramount.

The multi-purpose portal stage is emblematic of a government that is responsive to the evolving needs of its constituents. It resonates with the spirit of integration, transparency, and convenience. The portal, as a nexus of universal services, reflects the embodiment of digital governance's aspirations. In this phase, government's commitment to service excellence, efficiency, and innovation converges, establishing a robust foundation for the forthcoming stages of electronic service evolution.

Stage 4: Portal personalization

The "Portal Personalization" stage, a pivotal progression within the encompassing Six Stage Model of electronic service implementation postulated by respected researchers like Deloitte and Touche (2001) and Irani et al. (2006), marks a significant leap towards tailor-made digital experiences. Evolving from the previous stages, this phase embodies a strategic transformation wherein governments empower users with the ability to customize portals based on their individual preferences and needs.

At the heart of this stage lies the principle of user-centricity, where the government acknowledges the diverse requirements of its citizens and businesses. By offering customization options, the portal transcends being a mere transactional interface, metamorphosing into a dynamic platform that adapts to each user's unique context. This fosters a sense of ownership and engagement, aligning the digital journey with the users' preferences.

The customization capabilities span a spectrum of dimensions. Users can personalize content, layout, and functionality, arranging information and services in a manner that resonates with their priorities. Whether individuals prefer quick access to tax-related services or educational resources, the portal can be configured to meet these distinct demands. Moreover,

personalization extends to language preferences, accessibility features, and even the arrangement of widgets, ensuring a seamless and inclusive experience for all users.

However, the orchestration of portal personalization involves intricate layers of design, technology, and data management. Systems must be architected to seamlessly implement user preferences, without compromising security or data privacy. Data analytics play a pivotal role, as insights gleaned from user behavior inform the design of effective personalization options.

The portal personalization stage epitomizes the government's commitment to fostering meaningful digital interactions. It underscores a departure from the one-size-fits-all approach, elevating digital governance to a realm where individuals find resonance and value in their online engagements. This stage not only amplifies the effectiveness of electronic service provision but also amplifies user satisfaction, reinforcing the government's dedication to the digital well-being of its constituents.

Stage 5: Clustering of Common Services

The "Clustering of Common Services" stage, a pivotal facet within the overarching Six Stage Model of electronic service implementation as conceptualized by eminent researchers such as Deloitte and Touche (2001) and Irani et al. (2006), signifies a substantial stride towards streamlined and harmonized service delivery. Building upon the foundations of preceding stages, this phase represents a strategic shift wherein governments cultivate collaboration and cohesion among common services, resulting in a seamless and integrated service ecosystem.

This stage represents a profound departure from fragmented service delivery by dismantling operational silos and intermediaries that may hinder efficiency and user experience. Governments acknowledge the inherent interconnectedness of various services and departments,

hence embarking on a journey of consolidation. By clustering common services, they create a unified front, where users are presented with an integrated bouquet of services that cater to their multifaceted needs.

The essence of this stage rests on the synergy achieved through shared resources, processes, and insights. Commonalities among services are identified, and collaborative efforts are fostered to create a comprehensive and cohesive service landscape. This approach significantly reduces redundancy, minimizes bureaucratic hurdles, and expedites the delivery of services, ultimately enhancing user satisfaction.

However, the implementation of the clustering stage entails overcoming intricacies inherent to interdepartmental collaboration. Technical interoperability, data sharing mechanisms, and harmonization of processes become pivotal challenges. Moreover, this stage necessitates strategic governance and robust change management to align various departments towards a unified vision.

The clustering of common services stage epitomizes the spirit of efficiency, cooperation, and user-centricity. It speaks to a government's commitment to transcending operational barriers for the greater good of its constituents. As services converge, users encounter a seamless, holistic, and frictionless digital experience, underscoring the profound impact of a government that recognizes the power of synergy and collaboration in shaping a more efficient and responsive digital governance landscape.

Stage 6: Full Integration

This stage encapsulates a visionary culmination of e-government evolution. Building upon the progression of earlier stages, this phase embodies a comprehensive and transformative paradigm

wherein governments strive to provide advanced, harmonized, and personalized services that cater to the unique needs and preferences of every individual customer. At its core, this stage represents the zenith of digital governance, where a symphony of technological innovation, data integration, and user-centricity converge to create an ecosystem of unparalleled service delivery. Governments aspire to not only transcend silos and barriers but also to transcend the very concept of transactional interactions. Services are not just offered, but curated, anticipating the needs of customers and responding with a precision that reflects a deep understanding of their circumstances.

The full integration and enterprise transaction stage encapsulates a profound shift towards government services that are seamless, holistic, and adaptive. By amalgamating data and insights from various sources, governments are equipped to offer services that anticipate user requirements and pre-emptively address their concerns. This level of service personalization goes beyond mere customization; it reflects a profound engagement where the government serves as a proactive partner in the users' journey. However, realizing this ideal envisions overcoming a multitude of challenges. Technological complexities abound, from integrating vast and diverse data sources to ensuring the security and privacy of user information. The orchestration of such a sophisticated ecosystem necessitates robust governance frameworks, strategic partnerships, and a comprehensive understanding of data ethics and user consent.

The full integration and enterprise transaction stage signifies a government's commitment to pushing the boundaries of digital governance. It transcends transactional models and embraces a relationship-driven approach, fostering trust, engagement, and satisfaction. In this stage, users are not just consumers of services; they are active participants in a collaborative ecosystem

where the government's role extends beyond service provider to an enabler of citizens' aspirations and endeavors.

The researcher reviewed the literature on electronic service implementation models and found that they have evolved from three-stage to six-stage frameworks. For this study, the researcher adopted a five-stage model that aligns with the focus of the research area. The five stages are web presence, interaction, transaction, transformation, and networked presence or full integrated presence. This tailored model provides a structured lens for examining the evolution of electronic service delivery and a targeted analysis of each stage's role in advancing digital governance in the specific research domain.

2.3. Theoretical Literature

Within the context of this study, the researcher's attention was directed towards three foundational theories, namely the technology diffusion theory, stakeholders' theory, and institutional theory. Each of these theories offers a distinct lens through which to comprehend the dynamics and implications of electronic service implementation, as detailed below:

2.3.1. Technology diffusion theory

The theory serves as a comprehensive framework that scholars use to investigate the adoption and evolution of novel concepts. At its core, diffusion encompasses the process through which an innovation garners acceptance among individuals or within a community. This theory encompasses an array of sub-theories that collaboratively delve into the intricate dynamics of adoption. As articulated by Roger (2003), diffusion theory encompasses various pivotal elements including innovation, time, compatibility, and complexity. These facets collectively illuminate

the multifaceted journey an innovation undergoes as it traverses the realms of acceptance, integration, and eventual widespread adoption within a given context.

The propulsion of technological revolution stands as a pivotal catalyst driving transformative shifts within the service delivery realm. This imperative drive for change encompasses goals such as the elimination of paper-based transactions in favor of a safe method that allows for seamless acquisition for the purpose of payment processes, thereby aligning with the aspiration of delivering world-class services. This transition is envisaged to elevate the efficacy of service delivery performance by harnessing the potential of cutting-edge technologies. In this trajectory, the technology diffusion theory emerges as a critical compass, steering organizations towards orchestrating change and embracing technological innovations within the sphere of service delivery. As highlighted by Stanley et al. (2018), the technology diffusion theory assumes an essential role in guiding and directing the initiation of change and the integration of technologies that pave the path towards achieving world-class service delivery standards.

2.3.2. Stakeholders theory

Originally rooted in the private sector, the stakeholder's theory finds an increasingly relevant application within the community sector. This theory serves as a valuable framework to assess power dynamics within organizations, exemplified by its utility in gauging power shifts between university administrations and stakeholders. At its core, the theory highlights the pivotal stage of identifying all involved actors, a fundamental precursor to understanding the broader impact of information and communication technologies (ICTs) on both organizational and public administrative spheres. Moreover, the model encompasses a comprehensive evaluation of the theoretical implications of ICTs on power relationships. This encompasses multifaceted dimensions such as cost and time efficiency, the quality of decision-making processes,

dependency on third parties and consequent vulnerability to external influences, the capacity for surveillance, and the level of organizational transparency. By weaving these elements together, stakeholder's model offers a robust framework to navigate the intricate landscape of E-Service implementation within the public sector, enriching managerial insights and fostering a holistic understanding of the power dynamics and implications thereof (Zimmermann &Finger, 2005).

2.3.3. Institutional theory

Institutional theory, recognized for its applicability across various realms of information communication systems research, serves as a profound analytical framework. Scholars leveraging this theory underscore that information communication technology (ICT) alone falls short as a predictor of the impact on organizational performance enhancement. This perspective, as advocated by Avgerou (2000), contends that ICT's influence is intricately intertwined with a broader amalgamation of technical-rational and social forces. This synthesis neither solely propels nor becomes engulfed by the currents of organizational change; instead, it harmoniously interacts with these dynamics. Recognizing this, information system researchers must carefully consider the institutional milieu in which information systems are conceived, developed, and implemented. As underscored by Baroudi and Orlikowski (1988), the contextual fabric of institutions profoundly shapes the trajectory of information system evolution, thereby underlining the significance of a nuanced understanding of the interplay between technology and its sociocultural environment.

Furthermore, institutional theory proves invaluable in depicting the intricate interplay among actors and elucidating the emergence of isomorphic mechanisms during the implementation of information systems, as expounded by Chun, Luna-Reyes, and Sandoval-Almazan (2012). Within this literature, diverse mechanisms of institutional change come to light, encompassing

concepts like structural overlap and event sequencing. In the context of this particular E-Services implementation study, however, the prevalence of these mechanisms is not apparent. As such, the study hones in on three key mechanisms: institutional isomorphism, competing institutional logics, and institutional entrepreneurs. Institutional isomorphism manifests when an institution grapples with external pressures, necessitating responsive actions. In parallel, institutional entrepreneurs emerge as actors strategically harnessing their positions to rally support and resources, thereby catalyzing the establishment and empowerment of institutions. Additionally, the interplay of competing institutional logics emerges as a factor capable of both hindering and instigating institutional change, as highlighted by Al-Busaidy (2011). These theoretical constructs collectively form the bedrock upon which this study unpacks the intricate dynamics inherent in the realm of E-Services implementation.

The researcher's contention lies in the inadequacy of both the technological diffusion theory and the stakeholders' theory to comprehensively address the intricacies of the current study's context. While the technological diffusion theory centers on the adoption and development of novel ideas, it falls short in encapsulating the multifaceted challenges entailed in implementation. Similarly, the stakeholders' theory, albeit emphasizing the broad impact of ICTs, lacks a granular understanding of the nuanced practice and hurdles inherent in E-service implementation. Both theories are critiqued for their limited grasp of the complex reality faced in E-service implementation. Contrarily, the third theory posits that the successful implementation of a system necessitates an astute consideration of the institutional factors and situational dynamics that exert influence. As such, the researcher contends that the institutional theory, with its comprehensive perspective on the interplay of technology and institutional context, bestows a

superior explanatory prowess upon the challenges inherent in technology implementation within the specific contours of the current study.

2.4. Empirical Literature

Within this section, a comprehensive exploration ensues, delving into diverse studies conducted across the global spectrum, with a particular emphasis on the African and Ethiopian contexts. The discourse encapsulates a synthesis of findings concerning the multifaceted landscape of E-service implementation, encompassing its practices, challenges, and potential avenues. The studies, hailing from various geographical locales, furnish a collective narrative that unveils the intricacies underpinning the implementation of E-services within distinct societal frameworks. Through an intricate interplay of empirical investigations, the section weaves together an analytical tapestry that provides valuable insights into the practical manifestations, hurdles, and future prospects entailed within the realm of E-service implementation across these diverse contexts.

Quinta and Sirajul (2013) undertook a study focused on dissecting the intricate challenges that underlie the triumphant execution of e-government initiatives within the Sub-Saharan African landscape. Their investigation illuminated a host of formidable obstacles impeding the seamless implementation of e-government. Paramount among these hurdles were the inadequacies prevalent in ICT infrastructure, exacerbated by financial constraints that hindered the requisite technological advancements. Beyond the realm of technology, their study underscored a confluence of organizational intricacies, political complexities, and human resource limitations that collectively posed substantial barriers to effective e-government implementation. However, it's noteworthy to recognize that their study leaned heavily on secondary data sources, potentially limiting the full scope of insights attainable from firsthand experiences and on-ground realities.

As such, while their findings contribute to the discourse, it's important to acknowledge the need for a more comprehensive exploration that encompasses a broader spectrum of perspectives and empirical data.

The study conducted by Weerakkody et al. (2011) serves as a pivotal examination of the multifaceted facets that intricately interplay to shape the landscape of e-government within developing nations. Through a comprehensive lens, the study delved into the interwoven tapestry of factors spanning political, social, technological, and organizational realms. This holistic exploration unveiled a nuanced conceptual landscape, wherein these thematic dimensions converged to influence the trajectory of e-government implementation. The study's findings collectively inform the construction of a robust conceptual model, acting as a repository of essential insights that underscore the pivotal factors warranting consideration when probing the contours of e-government and its attendant barriers within developing contexts. The synthesis of these themes within the conceptual model encapsulates a dynamic representation of the complex interplay that underpins e-government dynamics, encapsulating a valuable blueprint for further analysis and informed decision-making within this intricate domain.

In their comprehensive analysis, Nabafu and Maiga (2012) meticulously delineated a set of prerequisites crucial for orchestrating the triumphant implementation of e-government initiatives within the context of Uganda. Their insightful examination revealed a tapestry of pivotal requisites, each serving as a cornerstone to the overall success of e-government endeavors. Foremost among these requisites is the allocation of ample financial resources, underscoring the paramount significance of securing adequate funding to fuel the transformative journey of digital governance. Concurrently, their study underscored the imperativeness of cultivating a robust ICT infrastructure, serving as the technological backbone that supports and sustains the envisioned e-

government landscape. Beyond the technical realm, the authors emphasized the indispensability of citizen training and sensitization, illuminating the need to cultivate a populace cognizant of the relevance and benefits bestowed by the e-government paradigm. Notably, the social and political factors were deemed instrumental, recognizing the intricacies inherent in the interplay of societal dynamics and the political milieu as shaping forces that influence the trajectory of e-government in Uganda. Collectively, these stipulated requirements construct a comprehensive framework, guiding stakeholders towards a holistic approach that addresses the multifarious dimensions underpinning the successful implementation of e-government within the Ugandan context.

In his comprehensive study, Abrham (2016) delved into the intricacies arising from the diversities stemming from regional disparities, religious variations, and other pertinent aspects, which contribute to the societal divisions. This delineation underscores the profound impact of various factors that underlie these divisions, indicating that the overarching issues, such as challenges in planning, can be dissected into finer granularity to facilitate a more nuanced comprehension of specific concerns. In doing so, Abrham's research exemplifies the approach of exploring the comprehensive landscape of broad factors, subsequently delving into their intricacies to unveil the underlying layers of complexity. Notably, the research methodology involves a meticulous examination of individual wide factors, which, due to their significant influence, warrant in-depth scrutiny. This approach also takes into consideration the interplay of situational context, recognizing that factors deemed significant in one situation may exhibit varying relevance in a different context. Consequently, the research echoes the importance of a tailored approach, wherein a nuanced investigation is conducted for each pertinent factor within the broader framework of E-Service Delivery Implementation (ESDI). This implies a cyclical

research process, wherein the evolution of factors and their contextual significance necessitates continuous exploration and re-evaluation to ensure a comprehensive and accurate understanding of ESDI dynamics.

Jember's 2014 comprehensive study delves into the intricate challenges facing the management of development programs within the Ethiopian public sector, particularly focusing on e-government initiatives. The research underscores significant obstacles, including a lack of public awareness regarding the benefits and usage of e-government, limited involvement of beneficiaries in program design and implementation leading to insufficient ownership and support, an underdeveloped culture of electronic service provision, deficient organizational capacity within government entities, weakened governance structures susceptible to corruption and mismanagement, and a dearth of a comprehensive e-readiness strategy hindering effective implementation and sustainability. The study underscores the complexity of these challenges and advocates for a multifaceted approach to ensure the effectiveness and longevity of e-government efforts in Ethiopia.

In 2015, Gossa conducted a perceptive examination of the efficacy of electronic service delivery within the Ethiopia Revenue & Customs Authority (ERCA). It sought to illuminate the operational framework of electronic service delivery within ERCA. Through rigorous investigation, the study unearthed a series of implementation challenges that E-Service delivery encounters within ERCA. The problems identified predominantly revolved around both technical and institutional spheres. Among the most salient challenges were issues related to manpower availability, recurrent system failures, frequent interruptions in electronic power supply, and network instabilities. These findings underscore the intricate nature of E-Service implementation

and emphasize the critical importance of addressing technical and institutional bottlenecks to ensure the effective and seamless delivery of electronic services, particularly within ERCA.

In 2016, Worku conducted a significant study examining the impact of e-government on performance enhancement, the promotion of good governance, and the improvement of public service quality. The findings revealed that the successful implementation of e-government can positively influence both good governance and the caliber of public services. For instance, it can enhance transparency and accountability by increasing public access to government information. Additionally, it can boost operational efficiency through the automation of governmental processes and facilitate citizens' access to information and services. Nevertheless, the study also identified several challenges that could impede the execution of e-government initiatives. These obstacles encompass a lack of leadership and commitment from government officials, inadequate proficiency in information and communication technology (ICT), limited awareness among citizens regarding e-government services, resistance to change, and subpar website design and content. The study concluded that it is imperative to address these hurdles in order to effectively implement e-government and fully realize its benefits.

In 2017, Endalew conducted a study focusing on the impediments to Ethiopian electronic public delivery. The research identified several barriers falling into three primary categories: employee-related hurdles encompassing a deficiency in skills and knowledge, a lack of motivation, and resistance to change; organizational-related challenges including insufficient funding, inadequate support from management, and a dearth of coordination among various departments; and customer-related obstacles such as a lack of awareness, limited access to technology, and a deficit of trust. The study underscored the importance of addressing these barriers comprehensively to enhance electronic public service delivery. Thesefindings collectively

underscore the multifaceted nature of challenges embedded within E-Services. The study's discerning analysis and classification reveal the complexities that impede the seamless execution of electronic public service delivery, consequently rendering these services less effective than initially intended. This study serves as a clarion call for comprehensive efforts aimed at addressing the diverse set of barriers that hamper the realization of the potential benefits of E-Services within the Ethiopian context.

Worku and Hadaro's (2019) study illuminates the pivotal role of Information and Communication Technology (ICT), with a particular focus on e-government, in nurturing a culture of good governance within the public sector. Their research passionately underscores the significance of e-government in augmenting and championing the principles of good governance. By delving into this critical nexus, the authors present a compelling argument for the indispensable worth of e-government in enhancing public sector capacities. They underscore how e-government acts as a transformative catalyst, ensuring principles of equality, fairness, efficiency, and effectiveness in service delivery. The study's profound insights accentuate how e-government resonates not only as an essential tool for governments across diverse landscapes, but as a mechanism for fostering stakeholder engagement, integrating citizen feedback, and maintaining consistent connectivity with citizens. Through their exploration, Worku and Hadaro magnify the immense potential of e-government to be a cornerstone in shaping transparent, participatory, and effective governance practices, thereby reaffirming its pivotal role in both developed and developing countries.

The study conducted by Marcus et al. (2020) delves into the realm of e-service learning within the context of higher education, a domain gaining increasing traction as educators navigate the shift towards online learning platforms. By systematically reviewing a range of scholarly works,

the study provides a comprehensive overview of e-service learning, wherein the fusion of instructional content and service activities takes place in a virtual landscape. In particular, the investigation centers on the integration of information and communications technology (ICT) into service-learning projects, spotlighting its multifaceted role encompassing communication, collaboration, data collection, reflection, and instructional delivery. Noteworthy is the observation that while ICT's presence in service-learning endeavors is on the rise, scant attention has been directed towards scrutinizing students' engagement within this digital e-Service Learning environment. The study thus underscores the imperative for forthcoming research to illuminate the optimal deployment of technology within service-learning courses, particularly aimed at capturing the focus of contemporary digital natives and fostering active learner participation, thereby transcending the mere utilization of technological tools in the realm of service-based education.

In the insightful study conducted by Ingrams et al. (2020), the study sheds light on the intricate interplay between institutional and environmental factors, positing that the evolution of municipal e-government growth follows discernible stages molded by the influences of these elements. Notably, the study addresses a critical gap in existing research by meticulously unraveling the distinct success drivers underpinning these various developmental stages. Anchored in an expansive dataset spanning from 2003 to 2016, encompassing the largest cities in the world's top 100 technologically advanced countries, the study employs rigorous cluster analysis to decipher overarching growth trends. Intriguingly, it discerns the emergence of four distinct clusters delineating e-government development patterns. Subsequently, through rigorous regression analysis, the study delves into the specific factors propelling these developmental stages. The findings substantiate a consistent positive association between population size, GDP,

and regional competition across all developmental phases, underscoring their integral role as uniform drivers. However, the nuanced role of democracy level in this intricate landscape comes to the fore, exhibiting a dynamic influence. It emerges as a positive driver for higher stages in larger countries, while assuming a less straightforward trajectory in smaller nations, where it exhibits a negative association.

Aneke et al. (2019) delve into the complexities surrounding the implementation of e-government initiatives in developing countries, using Nigeria as a case study. The study is framed against the backdrop of the swift advancements in the information and communication technology (ICT) sector and the widespread adoption of the Internet across the globe. Capitalizing on these technological leaps, governments have sought to harness e-services to enhance citizen engagement, streamline service delivery, and curtail the costs of governance. E-government emerges as a potent platform with the potential to revolutionize the efficiency and effectiveness of public services, but it necessitates a profound transformation of processes, infrastructure development, capacity building, and more. This study underscores that while the promise of e-government is substantial, its successful implementation demands a concerted effort to address a multifaceted array of challenges. Notably, this transition involves not only technological shifts but also entails sweeping changes in political dynamics, cultural norms, organizational structures, and societal relationships with government entities. Consequently, the adoption of e-government necessitates a meticulous consideration of pivotal factors encompassing political, cultural, organizational, technological, and social dimensions. Employing the lens of the Institutional Theory, the study explores these dimensions and sheds light on the factors that exert a profound impact on the implementation of e-government systems within Nigeria. To unravel these intricacies, the research employs a qualitative approach, leveraging semi-structured

interviews to gather data. The findings paint a comprehensive picture of the hurdles and determinants that characterize the landscape of e-government implementation in Nigeria. The primary obstacles affecting the advancement of e-government adoption include instances of corruption within public offices, financial constraints, a shortage of skilled personnel, resistance to significant change, technological limitations, a deficit of IT professionals in public sectors, apprehensions regarding data privacy and security, the legal framework, insufficient IT infrastructure, restricted power supply, and administrative hurdles.

Bakunzibake's (2019) study examines the enhancement of e-Government service implementation in Rwanda from an organizational standpoint. Amid the pursuit of accelerated development, developing countries have embraced advanced ICTs and e-Government to enhance public services, yet implementation efforts often yield unsatisfactory results, particularly in resource-constrained Least Developed Countries. This can be attributed in part to overlooking organizational intricacies. Bakunzibake's thesis investigates how e-Government implementation can be refined within Rwanda's context. Employing a socio-technical perspective, the study combines qualitative case studies and literature review, spotlighting two cases: an Enterprise Content Management system and a one-stop e-Government platform called 'Irembo.' The study reveals a focus on digitalization that overshadows organizational change concerns, such as processes and policies. Moreover, it identifies a lack of clear objectives and monitoring in local government implementations. The study underscores the need to balance technical and social dimensions for optimal e-Government outcomes. A pivotal contribution is the Plan-Do-Evaluate-Resolve (PDER) model, conceived from literature analysis, offering a holistic framework to address challenges and optimize e-Government service implementation.

Ergado's 2019 study sheds light on the pivotal role of Information and Communication Technology (ICT) in shaping pedagogical practices within higher education, focusing on the context of Ethiopia. Within this backdrop, the study explores the multifaceted influence of ICT in the Ethiopian higher education landscape, where endeavors to integrate technology into teaching and learning are underway, albeit with inadequate progress. The study identifies key factors that impede the full realization of ICT's potential, including limited infrastructure, users' attitudes toward technology, insufficient management support, shortage of skilled human resources, and policy-related challenges. To elucidate the role of ICT within Ethiopian higher education, the study employs a combined approach involving literature review and interviews with professionals from the Ministry of Education and the Ministry of Science and Technology. The findings pinpoint the absence of a comprehensive ICT policy tailored for pedagogical practices as a central hindrance to effective integration of technology into teaching and learning. Additionally, the study underscores obstacles such as insufficient top-level management backing, implementation hurdles, inadequate training for educators and specialists, organizational structure issues within the administrative framework, and students' competencies in utilizing ICT for their learning journey. In essence, Ergado's research underscores the critical importance of a well-defined ICT policy framework and the resolution of a range of challenges in order to harness the full potential of ICT for transformative pedagogical practices within Ethiopia's higher education system.

The study conducted by Worku and Hadaro (2019) delves into the intricate landscape of Information Communication Technology for Development (ICT4D) within the realm of public sectors, scrutinizing its role in shaping good governance. Amidst the ongoing development revolution, the 21st century emerges as the age of understanding, intricately interwoven with ICT

for growth, fostering a pathway to eco-friendly smart societies and propelling public sector reforms. This study endeavors to address the fundamental query of whether digital government is merely a fleeting policy trend or indeed yields tangible impacts on good governance within public sector organizations. Anchoring their analysis on empirical evidence drawn from Ethiopia's Federal Document Authentication and Registration Agency (DARA), the research employs a quantitative approach, utilizing multiple linear regression models to examine the proposed hypothesis. The study's outcomes illuminate the significant role of successful E-government implementation in bolstering and advancing good governance within public sectors. This implementation not only amplifies the capacities of public sectors to ensure equity and impartiality in service delivery but also elevates accountability and transparency among experts and officials. As digital platforms become more usable, instances of maladministration diminish, while digital public service delivery grants easier access to information and equips citizens with advance knowledge of service requisites. Furthermore, E-government establishes a connection between public sectors and citizens, actively involving the latter in policy decision-making processes. In essence, the study underscores that ICT-driven advancements in public sector services hold substantial potential to transcend being a mere policy trend, ultimately fostering a more transparent, participatory, and effective landscape of governance.

In the study conducted by Verkijika and De Wet (2018), the focus is on the adoption of e-government services in sub-Saharan Africa, particularly in the context of South Africa. Over the past decade, there has been a growing interest in comprehending the factors that underpin the acceptance of e-government services, employing various technology acceptance models. Among these, the Unified Model of Electronic Government Adoption (UMEGA) stands out as a validated framework that has exhibited superior performance compared to other models.

Through empirical research utilizing data from 282 respondents, the study empirically validates and extends the UMEGA model. The outcomes reveal that, barring the connection between effort expectancy and attitude, all other anticipated associations within the UMEGA framework are substantiated. The extended version of the model outperforms the original, leading to a modest increase in the variance explained for attitudes and a slight improvement in behavioral intention. The findings highlight that elements such as performance expectancy, social influence, perceived risk, and computer self-efficacy significantly impact attitudes, while attitudes themselves, along with facilitating conditions, government trust, and internet trust, directly influence behavioral intention. This study not only underscores the necessity for refining e-government adoption models to suit diverse contexts but also furnishes insights for the South African government's strategic enhancement of e-government adoption.

The study by Asad et al. (2018) addresses the pivotal concern of service integration within electronic government implementations worldwide. The provision of integrated services through a unified portal for citizens, businesses, and stakeholders engaged in electronic government activities represents a substantial opportunity for governments to enhance the efficiency and effectiveness of their services. The paper's objective is to furnish a comprehensive background and theoretical framework for comprehending the significance of service integration within electronic government programs, aiming to accomplish their core objectives on a global scale. Through an extensive literature review encompassing electronic government in general and the specific issue of service integration, the study sheds fresh insights on essential concepts, definitions, attributes, interactions, models, goals, advantages, challenges, and analytical foundations pertinent to the topic. As a consequential outcome, the paper introduces a model proposing a set of crucial factors that contribute to achieving service integration within electronic

government implementations, while also elucidating the pivotal role of service integration in these initiatives. A significant contribution of this work is its facilitation of a robust understanding of the essence and impact of service integration in electronic government endeavors, thereby laying the groundwork for further research in this dynamic domain.

In 2018, Abera conducted a study focusing on the factors influencing the adoption of e-government services in Ethiopia, particularly within the Ethiopian Revenue and Customs Authority (ERCA) Large Taxpayers Office. The research identified four key factors significantly impacting the intention to use e-government services, including performance expectancy (belief in task improvement), effort expectancy (perception of ease of use), awareness (knowledge of service availability and benefits), and website quality (perceived website effectiveness). Additionally, the study found that facilitating conditions (availability of resources and support) and intention to use (willingness to employ services) were pivotal in influencing the actual adoption and utilization of e-government services. Notably, the research also highlighted a significant gender-based discrepancy, with males exhibiting a higher propensity for e-government service adoption compared to females, while no notable disparities were observed among different age groups of adopters and non-adopters. This research contributes to a deeper understanding of the factors driving e-Government adoption and provides insights valuable for enhancing adoption rates within the context of ERCA and beyond.

Moges' 2017 study delves into the transformation of educational practices in Ethiopia through the integration of information and communication technology (ICT), with a focus on bridging digital divides and fostering a knowledge-based society and economy. Despite global advancements in ICT access and usage, persistent disparities exist both between and within countries. ICT's potential lies in its capacity to enhance educational flexibility, enabling learners

to access knowledge anytime and anywhere. It reshapes teaching and learning dynamics, empowering learners to take a more active role, thereby fostering lifelong learning and elevating learning quality. The study critically assesses the role of ICT in Ethiopia's educational landscape, underscoring its potential to transcend barriers of time and distance, facilitate collaboration, and share knowledge among educators and students. It explores how ICT can transform pedagogy, leading to reimagined program delivery in future universities, with the instructor's pivotal role emphasized. A central challenge is instructors' lack of adequate preparation to integrate ICT effectively, due to limited and inconsistent training opportunities, resulting in low proficiency and comprehension of technology's educational applications. The study highlights successful instances of ICT integration in Ethiopian higher education, while acknowledging financial constraints and the need for capacity building in an era of economic challenges. The paper concludes that despite limitations, ICT aligns with contemporary constructivist learning paradigms, enhancing education quality. It calls for the integration of ICT into teaching using pedagogical approaches, emphasizing continuous professional development for instructors, collaboration, and contextually relevant course content creation. Ultimately, the study underscores that integrating ICT into education is a crucial step toward fostering a knowledge society, advocating for comprehensive instructor support, and addressing policy and resource challenges to maximize ICT's transformative potential.

Amareswaran's (2017) study delves into the achievement of electronic service in colleges/universities governance, recognizing education's role in both national and individual development. The objectives of higher education have evolved from character development to economic advancement, and technology plays a transformative role in this context. In the modern, scientific, technological, and globalized world, individuals' lives undergo dynamic

changes comparable to the natural world. Administrators within this landscape are leveraging Information and Communication Technologies (ICTs) to facilitate efficient and swift communication with people. In this context, the University Grants Commission (UGC), a pivotal regulatory body in India's higher education landscape, employs ICTs to streamline its operations. This study shines a spotlight on the successful integration of e-governance within higher education governance, showcasing how technology is harnessed to enhance administrative functions, improve accessibility, and promote efficiency in delivering educational services in line with the evolving demands of a changing society.

Abdulbaqi's (2016) study delves into the implementation of electronic government at Amarah, Iraq, focusing on encounters faced and future approvals. In the ever-evolving landscape of economics, politics, and technology in the 21st century, governments are compelled to meet citizen demands effectively. E-Government emerges as a solution, transferring traditional government services to online systems accessible by citizens, enabling round-the-clock access. Through rule-based systems, citizens can connect with government ministries digitally. The city of Amarah in southern Iraq initiated electronic system integration in 2005, and by 2012, efforts were underway to establish an E-Government infrastructure in collaboration with the UN. However, challenges and concerns regarding potential pitfalls have resulted in the delayed implementation of E-Government systems. The study's objective is twofold: first, to illuminate the challenges that developing countries face when implementing E-Government; second, to conduct a comparative analysis of successful E-Government implementations in countries such as South Korea, Bahrain, and Australia. Furthermore, the study endeavors to develop a feasible framework for implementing an E-Government system tailored to Amarah's specific circumstances. It acknowledges that while successful E-Government models exist, their direct

adoption might not yield the same outcomes due to financial, cultural, political, educational, and other contextual disparities. In sum, Abdulbaqi's research highlights the intricacies of E-Government implementation in developing regions, offering insights into the challenges and complexities unique to each environment and aiming to pave the way for effective E-Government integration in Amarah and similar contexts.

The study conducted by Alsaeed and Adams (2016) introduces a conceptual framework tailored for eService delivery systems within developing countries marked by high levels of instability. The framework aims to comprehensively encompass the pivotal factors, encompassing both facilitators and impediments that significantly contribute to the successful implementation of e-Services in nations grappling with a precarious geopolitical environment. While the necessity of e-Services persists in such countries, their provision becomes considerably challenging due to the additional obstacles they face. Despite this, the academic literature addressing the execution of transformative e-Government initiatives during times of geopolitical instability remains sparse. The study seeks to bridge this gap by identifying the critical factors that influence the efficacy of such eService implementations. To achieve this, the example of Syria, along with comparable developing nations confronting analogous challenges, is employed as a reference point. The research draws inspiration from Osborn and Gaebler's "reinventing government" framework, which outlines ten principles for government transformation. This framework is employed to assess e-Government instances within the Syrian context, in conjunction with prior research that addresses barriers and facilitators of e-Government activities within countries experiencing instability. The resulting conceptual framework provides a foundational structure for comprehending e-Government activities in nations navigating periods of geopolitical uncertainty. By amalgamating insights from both successful and challenged cases, this

framework offers a comprehensive understanding of eService implementation dynamics in the complex landscape of nations grappling with instability.

In their 2016 study, Kvasnicova and colleagues delve into the intricacies of e-services, addressing the challenges of defining and categorizing them while proposing an innovative classification model. In the digital age, activities such as emailing, online music streaming, internet banking transactions, and e-ID usage all fall under the umbrella of e-services. However, the task of precisely defining an e-service remains elusive, with numerous definitions attempting to encapsulate their essence and distinct production characteristics. While these definitions hold significance for economic theory and practical application, a universally accepted definition has yet to emerge. In pursuit of clarity, supranational institutions, scientists, and researchers strive to establish a singular definition. However, many of these definitions limit e-services to domains like e-government, e-learning, and e-commerce, which prove inadequate for comprehensive classification. The study focuses on the classification of e-services, exploring various approaches that categorize them based on branches, processes, and other dimensions. The researchers conducted a study aiming to comprehensively review e-service definitions and classifications, highlighting various established models like the e-co model, e-ladder model, E-Diamond model, 2 * 2 matrix for service and product classification, and the fulfillment-product classification. In their endeavor to contribute to this field, they introduce their own innovative classification model known as the 3D model. This model is characterized by three dimensions: the degree of interactivity, indicating the level of interaction between user and service provider; the degree of digitization, denoting the extent of electronic delivery of the service; and the degree of customization, reflecting the adaptability of the service to individual user needs. This 3D model offers a more encompassing and adaptable approach to categorizing e-services compared to

existing models, and it is capable of classifying a wide range of e-services, from basic online transactions to intricate interactive services. The researchers anticipate that the 3D model will prove valuable for researchers, practitioners, and policymakers seeking to enhance their understanding and implementation of e-services. This model is grounded in the principles of stages models and the Diamond model, while also incorporating user needs and fulfillment throughout the process. Through an empirical analysis of existing definitions and classifications, the study introduces their innovative 3D model, distinguishing itself from many prevailing models that predominantly address public e-services. Instead, this new perspective aims to offer a classification applicable to all known e-services, providing a holistic understanding of their complexities.

Samuel's 2015 study delves into the implementation of e-government within the Ethiopian Revenue and Customs Authority (ERCA) Large Taxpayers Office (LTO), where ICT has been employed to automate tax assessment and collection processes with the aim of boosting tax revenue. The research reveals notable strides made by ERCA in adopting e-government practices. Nonetheless, there remain persisting challenges that require attention. These include a lack of awareness among some taxpayers regarding the availability of e-government services, a deficiency in the necessary skills for utilizing such services, occasional technical glitches in the e-government systems, and apprehensions regarding the security of personal information among certain taxpayers. However, despite this effort, the increase in revenue has been reported as relatively low compared to the country's tax base. Studies also reveal administrative burdens and noncompliance with tax laws, leading to substantial losses in tax revenue. The study aims to assess the extent to which e-Government is recognized and effectively implemented as a strategic solution to address these limitations within the ERCA LTO tax administration system.

Although ERCA has been working on tax administration reforms, these changes are not fully aligned with the national e-Government plan. The focus has primarily been on a limited number of large taxpayers, lacking a comprehensive and integrated e-Government approach. The satisfaction level of large taxpayers with ERCA's website, functioning as a one-stop portal, is also reported at only 52%. E-Government stage assessment places ERCA in the emerging stage, characterized by informational e-Services rather than transactional ones. Benchmarking with Sub-Saharan African countries highlights ERCA's need to transition toward integrated e-Services, fiscal transparency enhancement, optimized knowledge management, and improved e-Payment to augment e-Filing. Addressing these challenges, the study suggests a robust transformational change strategy, surpassing mere automation, to advance ERCA's e-Government endeavors towards higher stages guided by a comprehensive e-Government strategic plan.

In their 2014 study, Abdelsadeq and colleagues focused on investigating the availability and awareness of e-services in the context of higher education in Libya. Through a survey, the research aimed to understand the adoption and utilization of national Libyan e-services by students in higher education. The collected data underwent reliable analysis, confirmed by a Cronbach's alpha value exceeding 0.90. Descriptive statistics revealed a strong relationship among all the factors under investigation. The study's findings indicated that respondents predominantly expressed agreement with the factors examined to assess the adoption of e-services. Further analysis, utilizing the Pearson *Chi*-square test to assess demographic differences, unveiled significant variations among e-service adopters in higher education in terms of gender, professional background, and education level, with a notably high correlation between these factors. Notably, the study revealed a substantial awareness of e-government services

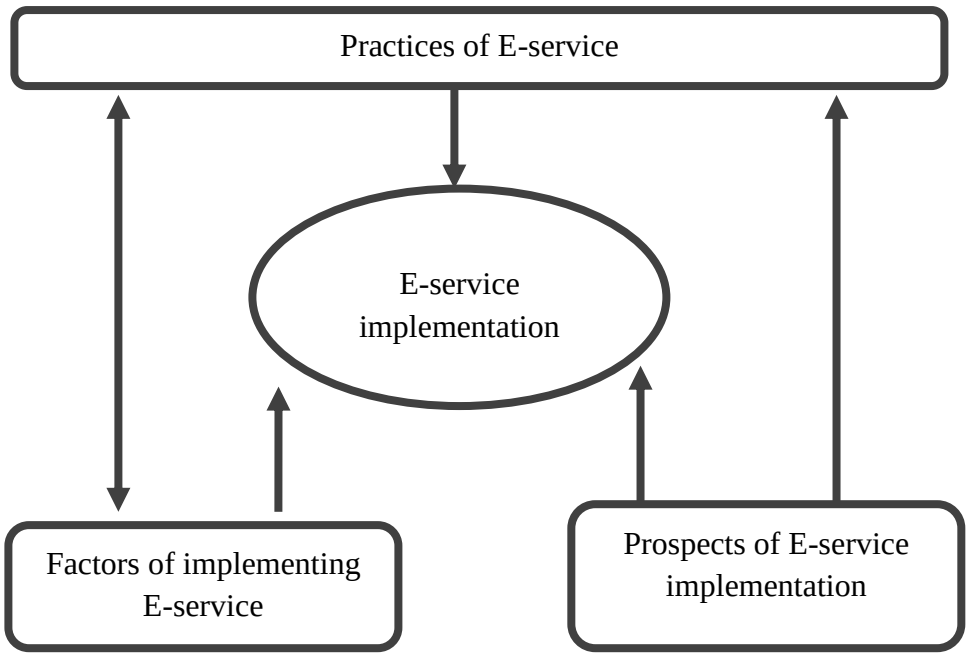
among participants, with 84.1% confirming their awareness. However, only 42% of participants agreed on the necessity of services introduced by e-government. Intriguingly, a substantial portion of participants (603 responses) expressed skepticism about the necessity of services presented via the e-government website.

Jember (2014) conducted a study that delved into the challenges faced in managing development programs within the public sector, using the case of the e-government program in Ethiopia. The research aimed to comprehensively assess obstacles in this context, employing a descriptive survey method involving four public institutions engaged in e-government projects and their beneficiaries. The participants, encompassing program/project managers, experts, support staff, educators, students, and business community members, were chosen using purposive sampling. Data collection involved questionnaires, interviews, document reviews, and observations, the data were analyzed with the help of SPSS software. Findings highlighted diverse challenges faced by the e-government program, including limited public awareness, restricted beneficiary involvement, a lack of electronic service culture, organizational limitations, weak program governance, and insufficient strategic e-readiness. These hurdles often originated from inadequate readiness and appreciation of past efforts. The study emphasized the program's modest contributions and the challenges it confronted. Although the government introduced an e-government strategy in 2010, the immediate impact was limited, and cumulative positive effects were anticipated to require time. The research proposed an Office for e-government councils and swift appointment of high-level council members by the government to address these issues and ensure the program's intended outcomes.

2.5. Theoretical Framework of the Study

The study's theoretical framework encompasses three interrelated dimensions designed to collectively address the research objectives. Firstly, it explores the attitudes of both students and faculty members towards the practice of E-service implementation. The second dimension focuses on identifying influential factors that influence E-service implementation. Additionally, the study evaluates the potential benefits associated with expanding E-service implementation, which include efficiency gains, stakeholder satisfaction, and potential concerns. Generally, the linkage between key concepts of the study such as practice of E- service implementation, factors that influence E-service implementation, prospects of E-service implementation are presented in Figure 2.1 as follows:-

Figure 2.1: Theoretical Framework of the Study



Source: Constructed by the Author (2020)

CHAPTER 3: SCOPE OF THE STUDY AND RESEARCH METHODOLOGY

In this chapter, a comprehensive overview of the research framework is provided, encompassing various critical elements. The study area is meticulously described to establish the geographical context of the research, followed by an elucidation of the chosen research design that underpins the investigative structure. The research approach adopted for this study is expounded upon, shedding light on the methodological stance guiding the inquiry. A delineation of the diverse data sources utilized ensues, delineating the range of information channels harnessed to enrich the study's foundation.

The meticulous process of determining the appropriate sample size is elucidated, reflecting the precision in the selection process. Delving into the intricacies, the employed sampling techniques are laid out, elucidating the strategies deployed to guarantee a fair sampling of the intended audience. The methods employed for data collection are elaborated upon, delineating the systematic procedures used to gather pertinent information. Subsequently, the chosen method of data analysis is expounded upon, illuminating the analytical tools and techniques leveraged to distill meaningful insights from the collected data.

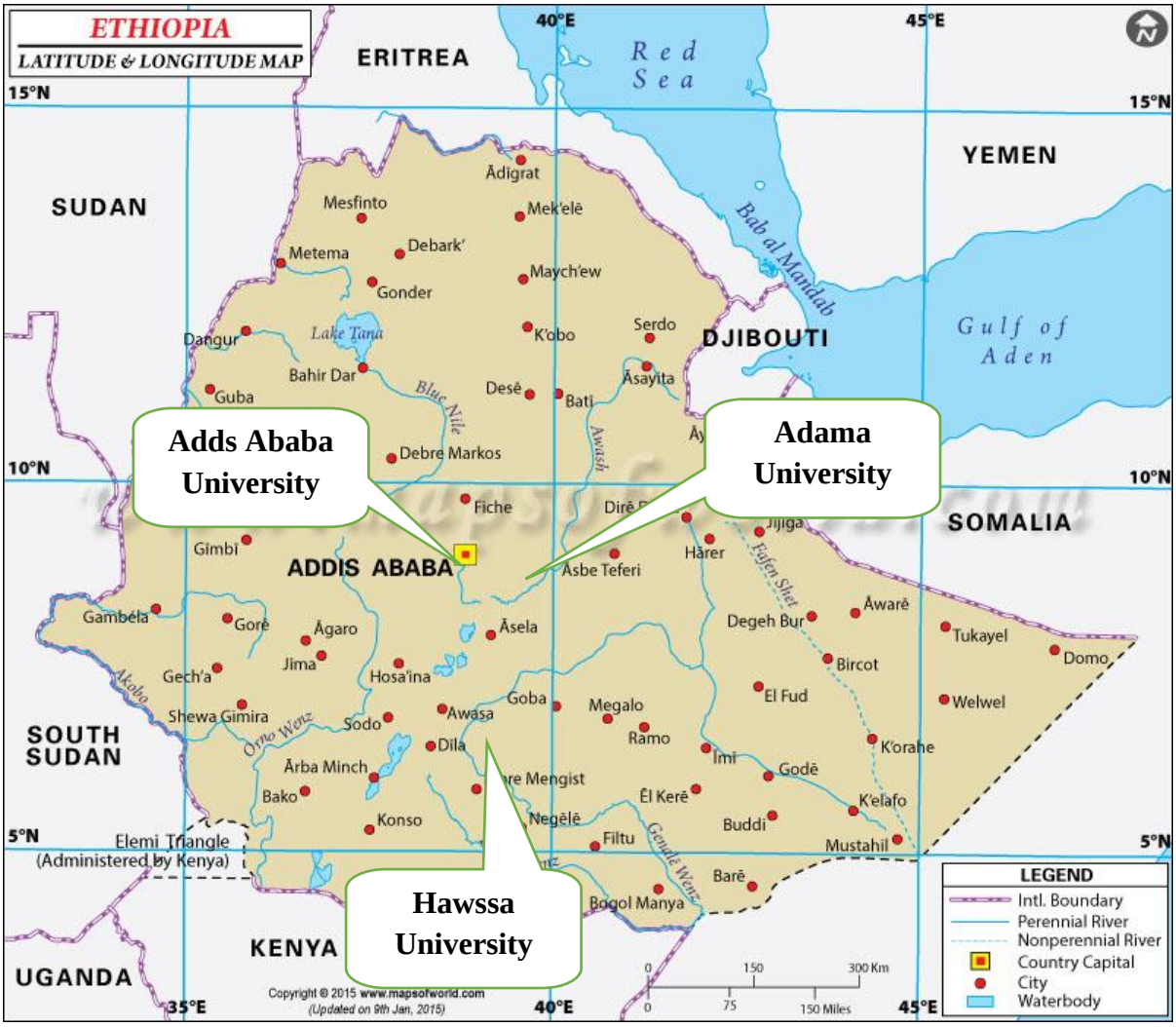
Lastly, the ethical considerations governing the research are addressed, showcasing the principled approach taken to safeguard the rights and well-being of all involved parties. The subsequent sections delve into each of these aspects, offering a comprehensive understanding of the meticulous planning and execution that underpin this study.

3.1. Description of the Study Area

The study's geographical scope encompasses the dynamic landscape of higher education institutions spread across the diverse and culturally rich nation of Ethiopia. Within its borders, a tapestry of 53 esteemed public universities and an impressive array of approximately 300 private colleges and universities collectively contribute to the nation's pursuit of knowledge. Some of the public universities are Adama University, Addis Ababa University, Addis Ababa Science and Technology University, Adigrat University, Aksum University, Ambo University College, Arba Minch University, Asosa University, Bahir Dar University, Bule Hora University, Debre Birhan University, Debre Markos University, Debre Tabor University, Dilla University, Dire Dawa University, Gonder University, Haramaya University, Hawassa (Debub) University, Jijiga University, Jimma University, Mada Walabu University, Mekelle University, Metu University, Mizan Tepi University, Semera University, Wachamo University, Welkite University, Wolaita Sodo University, Woldiya University, Wollega University,and Wollo University.

These public universities, dispersed across various regions, cities, and campuses, serve as the research's backdrop. The Ethiopian higher education ecosystem comprises a mosaic of academic institutions, each contributing to the intellectual and socio-economic advancement of the nation. These public universities play pivotal roles in shaping the country's educational landscape. Against this backdrop, the research seeks to delve into the challenges encountered in the effective utilization of ICT tools and resources within these institutions. By examining the intricate web of obstacles that hinder the seamless integration of technology into academic processes, the study aims to shed light for its implementation.

Figure 3.1: Administrative Map of Ethiopia and Selected Universities



Source: https://www.britannica.com/summary/Ethiopia

Out of the 53 public universities in Ethiopia, three institutions Addis Ababa University, Hawassa University, and Adama University were carefully chosen for this study due to their established track record and their substantial offering of graduate programs. Drawing from their wealth of experience and academic offerings, these universities were selected to provide a comprehensive representation of the higher education landscape.

3.2. Scope of the Study

The primary objective at the heart of this study revolved around a meticulous examination of the practices, challenges, and prospects inherent in the realm of E-service implementation. The geographical scope of the study was confined to the vibrant landscape of Ethiopia, with a deliberate focus on three prominent public universities: Hawassa University, Addis Ababa University, and Adama University. To comprehensively unravel the intricate facets within this domain, the researcher engaged in data collection activities that encompassed graduate program students, as well as other stakeholders within the academic milieu, alongside officials representing the Ministry of Science and Higher Education. This intensive data collection phase was diligently conducted during the temporal window spanning from January 2021 to March 2021, encapsulating a timeframe that inherently mirrors the pivotal intersection of academia and technology within the prevailing context.

3.3. Statement of the Problem

Numerous research investigations have shed light on the intricacies surrounding the implementation of E-services in organizations situated within developing countries, uncovering a landscape fraught with challenges. Apleni and Smuts (2020) presented a stark perspective, revealing that the journey of E-service implementation in developing nations is considerably more arduous compared to their developed counterparts. Correspondingly, Desta et al. (2019) underscored the manifold hurdles encountered by developing countries throughout the process of E-service implementation, highlighting a pronounced disparity when juxtaposed against the smoother trajectories experienced by developed nations. Further insights into this complex scenario were offered by Ingram et al. (2018), who illuminated that the execution of E-service initiatives in developing countries often fell short of initial aspirations. Their findings strikingly

indicated that a staggering 85% of these implementations yielded unsuccessful outcomes, shedding light on a glaring discrepancy between intention and realization. This palpable gap in E-service delivery within developing countries in contrast to their developed counterparts not only raises pertinent concerns but also underscores the pressing need for in-depth research to unravel the multifaceted reasons behind this discrepancy and pave the way for informed interventions that can empower the advancement of E-service implementation in developing contexts.

Higher educational institutions serve as crucibles of excellence, fostering the growth and refinement of individuals into adept professionals who subsequently channel the knowledge and competencies acquired toward national progress and development (Marcus et al., 2020). As the influx of students into universities surges, the dynamics of service delivery and management within these institutions undergo a profound shift, spurred by the evolution of E-Services. This transformation mandates the seamless online delivery of services to students and the college community through institutional websites, thereby accentuating the paramount importance of E-service implementation (Koudiki & Janardhanam, 2017). Across the global educational landscape, higher institutions are significantly investing in the deployment of E-services, recognizing their potential to revolutionize operational paradigms and enhance student experiences (Pathak & Manoj, 2018). Nonetheless, a palpable paradox persists as E-service implementation grapples with fragility, often marred by instances of underperformance and setbacks (Amare swaran, 2017). This intricate interplay underscores the imperative for higher educational institutions to navigate the nuances of E-service implementation with heightened vigilance, leveraging the potential while simultaneously addressing the underlying challenges to cultivate an educational ecosystem that resonates with excellence and innovation.

Universities have consistently occupied the forefront of E-Service provision, recognizing that ongoing assessment and evaluation of their E-Services are integral for sustaining alignment with the dynamic evolution of learning technology and diversifying service provisions (Koudiki & Janardhanam, 2017). Nevertheless, the prevailing landscape reveals a conspicuous deficiency in the examination of E-Service implementation quality and the status thereof within the university ecosystem. Notably, administrators and policymakers at the university level are confronted with a dearth of indicators that facilitate the evaluation of activities tied to E-service implementation (Ingrams et al., 2018). This glaring void underscores an imperative to delve into the intricacies surrounding the practices and challenges intertwined with E-service implementation within the realm of universities. A comprehensive inquiry into this realm becomes pivotal to not only glean insights into existing practices but also to unearth latent opportunities for improvement and innovation, ultimately fostering a cohesive landscape of E-service implementation that resonates with the institutions' missions, aspirations, and the swiftly evolving educational landscape.

The Innovation and Technology Ministry of Ethiopia has displayed profound determination in championing the cause of E-service implementation, positioning it as a central pillar in realizing the ambitious Ethiopian Sustainable Development Goals (SDG) for the year 2030 (Tolla, 2018). Notwithstanding the significant strides witnessed in the domain of E-service implementation across the nation, it emerges that universities find themselves trailing behind other sectors, and a palpable discrepancy becomes evident in the policy framework where explicit indicators concerning Electronic Service Delivery Implementation (ESDI) within university environments are lacking, thereby exposing a critical policy gap (FMCITE, 2018). Against a backdrop of limited scholarly discourse, the research landscape echoes with a dearth of substantial investigations, with only a handful of researchers, including Abraham (2018) and Endalew

(2017), embark on explorations of barriers to E-service implementation within the Ethiopian Revenue and Customs Authority (ERCA).

Further examinations conducted by Jember (2014) and Worku (2016) shed light on distinct facets of E-service implementation, with Jember focusing on roles and Worku delving into challenges; notably, these studies ventured beyond the educational domain. Therefore, the focal point of this study revolves around a compelling endeavor to develop a comprehensive framework conducive to the effective implementation of electronic services within the higher learning institutions of Ethiopia.

3.4. Objectives of the Study

The present study is framed by a dual set of objectives, encompassing overarching general goals as well as more targeted and specific aims, as delineated below.

3.4.1. General objective

The main objective of the study is to evaluate and enhance electronic service implementation in Ethiopian higher educational institutions through assessing attitudes of students and faculty, examining current practices, identifying influencing factors, exploring prospects, and developing a tailored implementation model.

3.4.2. Specific objectives

The study has outlined a set of specific objectives, which are as follows:

i. Assess the attitudes of students and faculty members towards E-service implementation.
ii. Assess the practice of E-service implementation in higher institutions of Ethiopia.
iii. Identify the factors that influence E-service implementation in higher institution of Ethiopia.

iv. Assess the prospects of E-service implementation in higher institutions of Ethiopia.
v. Develop a Model of E-Service implementation for Ethiopian Higher Institutions.

3.5. Research Questions

In alignment with the enumerated specific objectives, the researcher embarked upon a concerted endeavor to provide comprehensive responses to a series of pertinent research questions. These inquiries served as guiding beacons, illuminating the path towards a profound understanding of the multifaceted landscape of electronic service implementation within the context of Ethiopian higher educational institutions.

i. What are the attitudes of students and faculty member's towards E-service implementation?
ii. What are the practices of E-service implementation in higher institutions of Ethiopia?
iii. What are the factors that influence E-service implementation in higher institution of Ethiopia?
iv. What are the prospects of E-service implementation in higher institutions of Ethiopia?

3.6. Significance of the Study

In the contemporary landscape, the implementation of E-services assumes an exceptional significance, particularly in light of the unprecedented challenges posed by events like the COVID-19 pandemic. In this context, the findings emanating from this study assume a role of profound importance, furnishing policy makers with invaluable insights into the breadth and depth of E-service implementation practices, challenges, and potential trajectories. Equally crucial is the contribution of this study in aiding universities to establish precise, quantifiable, accurate, dependable, and timely benchmarks that not only gauge but also regulate activities tied to E-service implementation. This, in turn, yields tangible benefits for both the academic staff and the student body, amplifying their efficiency in service provision and harnessing the

potential of university E-service implementation to the fullest. Moreover, the implications extend to the realm of academia, rendering researchers empowered to undertake more nuanced and informed investigations on this pressing subject. Ultimately, the ramifications of this study ripple through the educational ecosystem, promising to refine E-service implementation strategies, invigorate operational paradigms, and fortify the resilience of higher institutions in an ever-evolving digital era.

3.7. Limitations of the Study

The study had several limitations that should be acknowledged. First, it was limited to a specific geographical area and a small number of participants. This could limit the ability to generalize the findings to other contexts. Here is a more detailed explanation of each limitation: Geographical limitation: The study was conducted in a specific geographical area, which means that the findings may not be applicable to other areas. For example, the findings may not be applicable to rural areas or to other countries.

Sample size: The study had a small sample size, which means that the findings may not be statistically significant. In order to increase the statistical significance of the findings, the study would need to be conducted with a larger sample size. Additionally, due to time and resource constraints, the data collection process might not have captured the complete spectrum of variables relevant to the research topic. The study's reliance on self-reported data from participants introduces the possibility of response bias and subjectivity, which could influence the accuracy and objectivity of the results. Furthermore, despite efforts to ensure a representative sample, there might exist inherent variations in the characteristics of the participants that could impact the study's outcomes. Lastly, as with any academic endeavor, unforeseen factors or

external circumstances could have influenced the research process, potentially introducing uncontrolled variables that could affect the study's validity and reliability.

3.8. Operational Definition of Key Terms

E-service: Refers to the types of service that are provided and used through the use of internet based system.

Implementation: Refers to the action or process that using internet based technology. The essence of implementation lies in the orchestration of internet-based technologies, converging various elements to facilitate the execution of tasks, functions, or services that are aligned with organizational objectives and stakeholder needs.

E-Service Implementation: Refers to the process of implementation that involves the service provision through internet based technology. The phases of implementation process are presence, interaction, transaction, transformation, and seamless of E-Service delivery.

3.9. Organization of the Thesis

The thesis was structured into five pivotal chapters, each serving a distinct purpose in the comprehensive exploration of the subject matter. Commencing the scholarly journey, In Chapter One, the study begins by providing essential context, defining the research problem, objectives, and questions. It highlights the study's significance, scope, and limitations, while defining key terms and outlining the organizational structure for the reader's guidance. Transitioning to Chapter Two, the canvas broadens to encompass the realms of conceptual, theoretical, and empirical literature that collectively enrich the study's theoretical framework and inform its perspective. Chapter Three meticulously unfurls the research methodology, laying bare the design, approach, and techniques that underpin the study's empirical underpinnings. The pivotal

Chapter Four embodies the culmination of this systematic exploration, as it unveils the crux of findings and deliberates upon their implications through insightful discussions. As the scholarly voyage reaches its crescendo, Chapter Five seamlessly weaves together the threads of major findings, encapsulating the essence of the study's revelations. Converging toward a fitting conclusion, this chapter crystallizes the study's contributions into a concise summary, concludes with thought-provoking insights, and furnishes pragmatic recommendations that bear relevance for both academic discourse and practical implementation.

3.10. Research Design

Research design refers to the structured plan guiding researches study, outlining methods, techniques, and procedures for data collection and analysis. It encompasses the study type, data collection methods, sampling techniques, analysis tools, and research process structure. The chosen design aligns with research questions, resources, and scope, with types like explanatory, descriptive, experimental, or exploratory serving diverse research objectives. In the course of this study, a strategic combination of explanatory and descriptive research designs was meticulously employed to illuminate the intricacies of the research objectives. The application of the explanatory research design proved to be highly pertinent, particularly given its capability to unravel the intricate associations and ascertain the key predictors associated with the dependent variable. This design was leveraged to delve into the underlying factors influencing the phenomena under investigation, thus facilitating a deeper comprehension of their causal relationships (Oleary, 2004).

Concurrently, the incorporation of the descriptive research design served as an indispensable tool for not only unveiling the current practices but also for peering into the future potential of E-service implementation within the study's context. This research approach presented a distinct

advantage, owing to its inherent ability to facilitate the systematic collection of data from a sizable and diverse sample with remarkable ease and abundance. Furthermore, as advocated by Kothari (2012), the descriptive research design emerged as the optimal approach for researchers aspiring to collect original data, aligning seamlessly with the study's aim to contribute novel insights to the scholarly discourse. The harmonious interplay of these two research designs underscores the comprehensive and multi-faceted approach undertaken to comprehensively address the research questions and attain a nuanced understanding of the intricate domain under investigation.

3.11. Research Approach

A research approach refers to the broader strategy or framework that guides the overall philosophical stance and methodological choices made by a researcher when conducting a study. It outlines the general perspective how the research questions will be addressed, data will be collected, and findings will be interpreted. The researcher skillfully adopted a mixed research approach, a methodological fusion that encompasses the collection and synthesis of both quantitative and qualitative data streams. The utilization of quantitative data, featuring numeric values, along with qualitative data, characterized by non-numeric scales, was a deliberate choice to comprehensively capture the multifaceted dimensions of the research context. The qualitative research facet facilitated the nuanced evaluation of participants' perspectives, permitting a subjective comprehension of their viewpoints. This strategic application is rooted in the recognition that a thorough narrative description often sparks inquiries into the underlying "why" aspects. In parallel, the quantitative research component facilitated the objective quantification of specific variables in numerical terms, a procedural framework that lends itself seamlessly to streamlined descriptive analysis (Creswell, 2009).

Throughout the course of the study, this dual approach harmoniously interwove quantitative and qualitative methodologies, adeptly harnessing numerical computation to elucidate data trends while simultaneously harnessing narrative narratives to convey insights extracted from qualitative data. The fusion of these two distinct yet complementary research paradigms enabled a comprehensive exploration of the research phenomenon, fostering a holistic and robust understanding of the intricate dynamics at play.

3.12. Source of Data

A comprehensive array of both primary and secondary data was meticulously gathered from diverse sources, all strategically aligned to fulfill the study's overarching objectives. The primary sources constituted a dynamic reservoir of information, meticulously procured from two pivotal categories: the voices of graduate students attending esteemed government universities within Ethiopia's academic landscape, which offered firsthand insights into the practical challenges of ICT usage, and the perspectives of key higher education officials hailing from the universities themselves and the esteemed Ministry of Science and Higher Institutions (MOSHE), their authoritative insights providing invaluable depth to the research. In parallel, the secondary sources cast a wide net, incorporating a range of authoritative materials such as books, articles, peer-reviewed journals, and existing research works, serving as a vital knowledge repository. These secondary sources, buttressed by insights garnered from exploratory internet searches, collectively contributed a substantial layer of contextual understanding to the research's thematic framework. This dual-pronged approach, combining the lived experiences of stakeholders with the wealth of documented knowledge, ensured a robust and multifaceted foundation upon which the study's insights were meticulously built.

3.13. Sampling Design

A sample design stands as a meticulously structured blueprint, intricately delineating the systematic methodology for extracting a representative subset from a broader population. This comprehensive plan encompasses not only the meticulous determination of the precise quantity of elements to be encompassed within the sample but also meticulously outlines the specific sample technique or procedure meticulously chosen by the researcher to thoughtfully curate the sample. As elucidated by Kothari (2012), it is an instrumental guide that navigates the intricacies of both sample size determination and the judicious selection of the sampling technique. As a manifestation of this methodical approach, the study unveiled the calculated formula employed to ascertain the optimal sample size, a process that harmoniously balances statistical accuracy with practical feasibility. Additionally, the selection of the appropriate sampling technique was a conscientious decision presented in tandem with the sample size calculation, underlining the harmonious integration of these crucial components within the research framework. Thus, the sample design not only constitutes the bedrock of methodological integrity but also serves as a strategic roadmap guiding the researcher's meticulous choices, ensuring that the extracted sample is a faithful reflection of the broader population, and that the subsequent analyses and insights hold robust credibility.

3.13.1. Sample size determination

As per the report of selected Universities (2020), there are 4010 graduate program students were currently enrolled. Therefore, this data was used as a benchmark to calculate the sample size. Accordingly, the representative sample size was determined by using the formula developed by Yamane (1967) as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = Sample size
N = Total Population
e = Sampling Error

Based on this formula, the total sample size of the study is determined as follows.

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{4010}{1 + 4010\ (0.05)^2}$$

$$n \approx 364$$

3.13.2. Sampling techniques

Following the meticulous determination of the sample size, the researcher adroitly employed a multistage sampling technique to precisely align with the study's overarching objectives. This astutely designed approach, executed in distinct stages, culminated in a comprehensive and well-balanced sample representative of the larger population. The first stage, undertaken with deliberate purpose, involved the purposive selection of three universities such as Addis Ababa University, Hawassa University, and Adama University a strategic choice based on their extensive experience and substantial array of graduate programs. In the ensuing second stage, a judicious stratification of colleges within these universities took place, fostering a more refined sampling structure. The third stage of the process was punctuated by a purposive selection of specific departments, a decision grounded in the meticulous consideration of the number of students associated with each department. The fourth stage, perhaps the most intricate, saw the seamless implementation of systematic random sampling technique at the individual respondent level. This step ensured an equitable representation across the sample, a fundamental tenet emphasized by Bhattacherjee (2012), while mitigating any potential biases or uneven distribution

observed in the original sampling frame. This technique facilitated the judicious selection of respondents by means of a kth interval, systematically ensuring a balanced distribution. The intricate interplay of these stages, founded upon rigorous methodological underpinnings, culminated in a comprehensive sampling strategy that mirrors the intricate nuances of the population under investigation, while upholding the integrity and credibility of the research outcomes.

Table 3.1:*Sampling Frame among Selected Universities*

Universities	Streams	N	n
Hawassa University	Social science	786	71
	Natural science	652	59
Addis Ababa University	Social science	807	73
	Natural science	653	59
Adama University	Social science	468	43
	Natural science	644	59
Total		4010	364

Sources: University registrar offices, 2020

3.14. Data Collection Methods

This study adopted a multifaceted and integrative approach to data collection, drawing upon diverse methodologies to capture a comprehensive view of the research landscape. The confluence of methodologies included the strategic utilization of survey questionnaires, a tool recognized for its efficiency in gathering structured responses from a sizable participant pool, enabling the quantification of patterns and trends. Concurrently, the Key Informant Interview

(KII) technique was judiciously employed, harnessing the rich insights and experiential narratives of knowledgeable individuals who possess intimate familiarity with the subject matter. This technique facilitated a deeper exploration of nuanced aspects, perspectives, and context-specific intricacies that might not be readily captured through standardized questionnaires alone. By harmoniously integrating these distinct data collection approaches, the study ensured a holistic and multi-dimensional understanding of the research phenomenon, combining quantitative data for broad trends with qualitative insights for depth and context, thereby enriching the research's findings and enhancing its overall validity and credibility.

3.14.1. Survey questionnaire

A meticulously designed closed-ended questionnaire was meticulously crafted, refined through iterative revisions, and thoughtfully administered in alignment with the study's objectives. The rationale behind selecting the closed-ended questionnaire as a data collection tool stems from its practicality, cost-effectiveness, capacity to engage a substantial participant pool, ease of interpretation, suitability for succinct and straightforward questions, and its remarkable efficiency in swiftly accumulating data. This method, well-recognized for its ability to swiftly amass information from a diverse range of respondents within a short time frame, emerges as an indispensable asset for gathering descriptive data, as underscored by Kothari (2012). By employing this instrument, the study harnesses the potency of the survey questionnaire to systematically capture and quantify participants' perspectives, paving the way for valuable insights into the research objectives.

The administration of the aforementioned questionnaire was meticulously extended to a targeted cohort comprising both selected students and dedicated staff members from the respective universities, as well as individuals vested within the Ministry of Science and Higher Institutions.

This instrument, meticulously designed to encapsulate the diverse array of participants, efficiently extracted vital insights by meticulously focusing on the demographic, social, and economic profiles of the respondents. Moreover, the questionnaire deftly encompassed a multifaceted inquiry, delving into the intricate landscape of E-service implementation. By adeptly soliciting perspectives on practices, challenges, and future prospects, the questionnaire cast a comprehensive net, allowing for the systematic capture of multifarious aspects underlying the research objectives. In this manner, the questionnaire emerged as a strategic conduit through which the rich tapestry of opinions, experiences, and anticipations was meticulously woven, paving the path for a comprehensive understanding of the subject matter.

The questionnaire, meticulously composed in the English language, underwent a pivotal phase of validation through a pre-test process. This trial phase involved the participation of 39 students sourced from universities external to the designated sample, a prudent strategy that enabled the researcher to evaluate the questionnaire's content coherence and the seamless progression of inquiries. The insights gleaned from this pre-test phase were instrumental in refining the questionnaire's formulation, with necessary adjustments and restructurings carried out to enhance its clarity and logical coherence. Armed with these enhancements, the questionnaire crystallized into its final form, effectively primed to glean accurate and meaningful responses from the targeted participants. In the pursuit of data collection, a team of six proficient enumerators was diligently assembled. In preparation for the task, an exhaustive half-day orientation was administered to these enumerators, meticulously outlining the protocols and methodologies to be adhered to during the data collection process. This strategic briefing was judiciously conducted on the eve of data collection, ensuring the enumerators were well-equipped and proficiently aligned with the research objectives before embarking on their crucial roles. This meticulous

orchestration underscores the researcher's dedication to methodological rigor and the meticulous management of every facet of the data collection process.

3.14.2. Key Informant Interview (KII)

A meticulously structured interview schedule was methodically formulated and deftly administered to a cohort of ten carefully chosen key informants. This elite group comprised academic vice presidents and ICT directorate directors from respective universities, in addition to three notable personnel from the Ministry of Science and Higher Institutions (MOSHE). This approach was undertaken to garner the insights of authoritative figures uniquely positioned to offer valuable insights into the research objectives. The interview process, as articulated by Coffey and Delamont (2003), served as an ideal avenue for addressing the intricate "why" and "how" questions intrinsic to the study's objectives. It offered a flexible and insightful conduit for these informants to candidly share their perspectives, opinions, and experiences. The selection of these key informants was judiciously executed through a purposive sampling technique, strategically aligning with their nuanced knowledge of the requisite information and their influential positions within their respective offices. In recognition of their commitments, the interviews were considerately scheduled during their working hours, and the discussions took place within the confines of their offices, ensuring a conducive environment for the exchange of ideas and insights. This methodology, underpinned by its strategic informant selection and structured approach, adeptly harnessed the richness of qualitative data to enhance the study's depth and contextual understanding.

3.15. Pre-Test

3.15.1. Validity Test

Validity refers to the extent to which a measure adequately represents the underlying construct that it is equally supposed to measure (Bhattacherjee, 2012). Content validity was checked by getting a comment from advisor and other experts.

3.15.2. Reliability Test

The reliability test is a fundamental assessment of the extent to which a measurement of a specific construct exhibits consistency and dependability. It gauges the degree of coherence among various components that constitute the same construct. When a set of multiple items that measure a construct is presented to respondents, their degree of uniformity in evaluating these items signifies the construct's internal consistency. This pivotal aspect of reliability is effectively quantified through the application of Cronbach's alpha coefficient, a statistical metric used to estimate the degree of internal consistency within a measurement scale. As articulated by Bhattacherjee (2012), this index serves as a potent tool to gauge the homogeneity and coherence of the items forming a construct, validating the reliability of the measurement and lending credence to the meaningfulness and consistency of the construct under scrutiny.

As outlined by George and Mallery (2003), the interpretation of reliability scores aids in evaluating the consistency and robustness of a measurement instrument. A reliability score exceeding 0.9 is characterized as excellent, surpassing 0.8 is deemed good, surpassing 0.7 is considered acceptable, surpassing 0.6 is regarded as questionable, exceeding 0.5 is classified as poor, and any value below 0.5 is categorized as unacceptable. In the context of this research, the Cronbach’s alpha model was adeptly employed, particularly well-suited for the utilization of

five-point Likert scales. To assess the internal consistency of the questionnaire, a reliability test was meticulously executed. This crucial evaluation, conducted with a subset of 37 graduate program students accounting for 10% of the total sample size served to scrutinize the questionnaire's reliability. Importantly, this subset was not included in the main data analysis, ensuring its exclusivity for this specific evaluation. The application of Cronbach's Alpha provides a quantifiable gauge of the questionnaire's internal consistency, aligning with the rigorous methodological standards upheld throughout the research process.

Table 3.2:*Reliability Test*

Variables	Cronbach's Alpha	No. of Items
Attitude of students	0.890	15
The practice of E-service Implementation	0.778	16
Student's E-service Usage Capacity	0.860	6
Top Managerial Commitment	0.864	6
ICT Infrastructure	0.889	5
Training	0.798	6
Employee Commitment	0.826	5
Prospects of E-service Implementation	0.972	10
Overall	0.946	69

Source: Pre-test data, 2021

As depicted in Table 3.2, we employed Chronbach's alpha to assess the reliability of the provided dataset. This test serves to gauge the overall consistency of the items used to define the scales. Cronbach's alpha is a widely accepted method for reliability assessment. According to Hair et al. (2010), an alpha value exceeding 0.7 indicates a strong fit, while a value surpassing 0.6 is deemed satisfactory. In this study, all factors exhibited a Cronbach's alpha greater than 0.7,

affirming their high reliability. Consequently, the overall reliability coefficient for the study variables stands at 0.946. This outcome affirms the questionnaire's suitability for conducting the study and for further analysis.

3.16. Data Processing and Analysis

The collection and management of quantitative data followed a meticulous progression encompassing various stages. Once gathered, the data underwent a thorough process of editing, wherein inconsistencies or errors were meticulously rectified to ensure accuracy and reliability. Subsequently, a systematic coding process was employed, assigning distinct labels to facilitate organized analysis. The encoded data was then meticulously entered into a computer software, with Stata for Windows Version 16 serving as the chosen platform for this purpose, leveraging its computational prowess for efficient data manipulation. The subsequent analytical phase encompassed an array of techniques that aimed to distill meaningful insights from the collected data. Descriptive statistics, including frequencies, percentages, mean, and Standard Deviation, were adeptly harnessed to illuminate data distribution and central tendencies, providing a comprehensive snapshot of the dataset's characteristics. Furthermore, to delve beyond surface insights, inferential statistics were judiciously employed. The correlation analysis facilitated the exploration of relationships between variables, unveiling potential connections that contributed to the broader understanding of the research context. In a bid to uncover the factors that wielded influence over E-service implementation, multiple linear regression emerged as a robust tool, unveiling the interplay of variables and their combined impact. This comprehensive and strategic analytical approach collectively underscored the researcher's dedication to harnessing quantitative data to draw substantiated and comprehensive conclusions, ultimately enriching the study's overall depth and significance.

3.16.1. Model Specification

The model rigorously assessed the degree of significance pertaining to the factors exerting influence on E-service implementation through the adept utilization of a multiple linear regression model. This method was meticulously chosen due to its alignment with the nature of the dependent variable, E-service implementation, which was inherently treated as a continuous variable. Linear regression emerged as the ideal analytical framework given its ability to effectively capture relationships between variables where one variable is dependent and influenced by the impacts of multiple explanatory variables. Through this method, the study aimed to unravel the intricate web of influences shaping the extent of E-service implementation, providing a quantitative lens through which to comprehend the interplay of various factors and their respective contributions to this pivotal outcome. By aptly employing multiple linear regression, the researcher undertook a comprehensive exploration, unveiling the nuanced dynamics that underscored the realization of E-service implementation within the research context.

$Y = \beta o + Xi\beta i + Ui$ ---------- (1)

Where Y = E-service implementation

Xi = a vector of explanatory variable, and 'i' is 1, 2, 3,4,5

β = coefficient of i^{th}independent variable

Ui = unobserved disturbance term

3.16.1.1 Diagnostic Tests for Model

Prior to incorporating the chosen variables into the multiple linear regression model, a fundamental step involves subjecting the model to rigorous diagnostic tests in order to validate

its underlying assumptions. In concurrence with the insights of Gujarati (2004), conducting such diagnostic tests is essential not only to establish the credibility of statistical inferences but also to ensure that appropriate conclusions can be drawn from the analysis. Consequently, the basic assumptions integral to a multiple linear regression model are systematically examined to validate their presence. These assumptions encompass Normality, where the distribution of residuals adheres to a normal distribution, a prerequisite that bolsters the accuracy of statistical inferences. Heteroscedasticity, another crucial assumption, pertains to the equal distribution of error variances across different levels of the independent variables, a tenet that ensures the model's robustness. Lastly, multicollinearity, which warrants scrutiny, refers to the absence of high correlations among independent variables, a condition that guards against redundancy and confounding effects within the model. Through diligent examination of these assumptions, the researcher endeavors to ensure the model's validity and reliability, thus laying the foundation for credible statistical analyses and meaningful research outcomes.

1. Normality

The underlying assumption posits that the disturbance terms conform to a normal distribution. A hallmark of the normal distribution is its symmetry around its mean, diverging from skewed distributions that lack this symmetrical quality. Should this assumption falter, the application of conventional tests for significance such as the simple t and F tests becomes compromised. To ascertain the adherence of the disturbance terms to a normal distribution, the Shapiro-Wilk test stands as a pertinent tool. This test probes whether the disturbance terms exhibit normal distribution characteristics. As articulated by Gujarati (2004), the Shapiro-Wilk test statistic's significance level becomes pivotal in this context. Should the residuals conform to a normal distribution, the Shapiro-Wilk test statistic would not register as statistically significant,

confirming that the disturbance terms indeed adhere to a normal distribution pattern. The vigilance in examining this assumption ensures the validity of subsequent statistical analyses, reaffirming the robustness of the model's outcomes and enhancing the integrity of the study's findings.

2. Heteroscedasticity

The assumption concerning heteroscedasticity postulates that the variance of errors is not uniformly constant. According to the insights shared by Gujarati (2004), in the presence of this assumption, the variance of the error term (ui) remains consistent across all observations for a given value of X. However, if the variance of errors deviates from this constancy, the term used is "heteroscedasticity." Detecting and addressing this issue necessitates the application of various statistical testing methodologies. A notably effective approach is the utilization of the Breusch-Pagan or Cook-Weisberg test, as emphasized by William (2015). This method enables the identification of heteroscedasticity, offering valuable insights into the variance discrepancies across observations. Additionally, a visual inspection of residuals plotted against fitted values serves as a pragmatic technique to detect heteroscedasticity visually. Alternatively, it proves insightful to plot independent variables that are suspected of being correlated with the error term's variance, further facilitating the detection of heteroscedastic patterns. Ascertaining the presence of heteroscedasticity, followed by its appropriate treatment, holds paramount significance in upholding the integrity of the model's outcomes and ensuring accurate statistical inferences.

3. Multicollinearity

As elucidated by Gujarati (2003), the concept of multicollinearity pertains to a scenario in which the identification of an independent variable's individual impact on the dependent variable

becomes arduous due to pronounced interrelationships among these variables. In simpler terms, it signifies a condition in which explanatory variables demonstrate significant correlation with each other. In the context of the present study, the examination of multicollinearity's presence involved the application of the Variance Inflation Factor (VIF) and tolerance statistics. These metrics serve as effective diagnostic tools to ascertain the existence of multicollinearity. Following a widely recognized guideline, when the VIF exceeds 10 and the tolerance drops below 0.1, it signals the presence of high collinearity among variables, as outlined by Gujarati (2003). This analytical approach is indispensable in validating the model's stability and ensuring that the inclusion of correlated variables does not distort the integrity of the regression analysis, thus reinforcing the study's reliability and the meaningfulness of its findings.

3.17. Framework Development Process

The development process of the framework for successful implementation of electronic services in higher learning institutions was guided by Design Science Research (DSR) and Soft Systems Methodology (SSM). DSR structured the process through problem identification, iterative artifact design, evaluation, and contribution to theory. SSM contributed by capturing diverse stakeholder perspectives through rich pictures, defining core problems, creating conceptual models, promoting dialogue and learning, and addressing social and human aspects alongside technical considerations, resulting in a comprehensive and effective framework.

3.17.1. Design Science Research Methodologies (DSR)

Knowledge development was identified as a paramount objective achievable through the strategic utilization of appropriate research approaches. The guiding foundation of this research work rested upon the utilization of diverse research approaches, acting as the pillars that orchestrated the identification, selection, and formulation of fitting research designs, strategies,

and methodologies for the systematic acquisition, processing, and analysis of data. Among these methodologies, deductive research processes surfaced as integral to extracting knowledge from established theories (Pierce, 1931). This avenue extensively leaned on the experimental design approach, primarily focusing on the accumulation of quantitative data. Moreover, deductive research pathways proved conducive to the broader generalization of the research artifact. Contrary to deductive research, inductive research processes emphasized a profound comprehension of real-world complexities, often enlisting the researcher as an active participant in the research process. This avenue embraced the utilization of qualitative data and offered a platform for the evolution of design structures, including artifacts, and the construction of intricate cases or scenarios (Saunders et al., 2003).

The fusion of inductive research with the abductive research process established a dynamic mechanism for revealing causal connections through iterative data generation and analysis, culminating in the creation of significant artifacts or theories. This cyclical methodology resonates with the seminal contributions of Pierce (1931) and the comprehensive insights shared by Vaishnavi et al. (2004). Following a thorough evaluation of the contextual intricacies, the alignment between the inductive research process and the overarching objectives of this research endeavor became evident. As a result of this thoughtful analysis, the inductive research process emerged as the optimal and congruent approach to guide the trajectory of this research, effectively navigating the complexities of the research landscape and illuminating its dimensions with clarity and depth.

Furthermore, it was of paramount importance to establish research methodologies aligned with the inductive research process. Drawing from the research objectives, a set of criteria was formulated to govern the selection of research methodologies. These encompassed the ability to

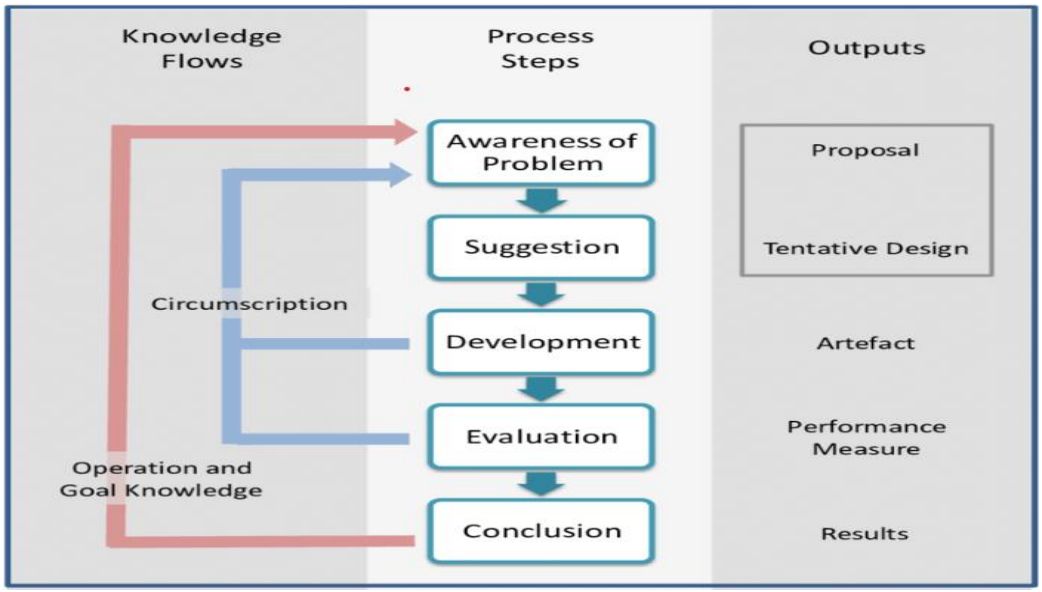
synthesize various studies aimed at a shared research objective, such as the development of a framework; proficiency in modeling e-Service services, eService maturity models, and information security maturity models; and adeptness in designing, developing, and evaluating a comprehensive framework. In light of these criteria, the design science research (DSR) process emerged as the chosen methodology.

The decision to embrace the design science research (DSR) methodology stemmed from its intrinsic prowess in fostering innovation and delineating the technical capacities and products essential for the streamlined development of artifacts, resonating with the viewpoints advanced by Denning (1997), Hevner et al. (2004), Tsichritzis (1998), and Vaishnavi et al. (2004). Rooted in a structured approach, the DSR methodology commenced with a meticulous identification of the prevailing problem, subsequently culminating in the formulation of well-founded solutions. Progressing through successive stages, the methodology navigated towards the tentative design phase, intricately derived through abductive reasoning from the reservoir of existing knowledge pertinent to the specific problem domain under scrutiny. This meticulous process culminated in the crystallization of a preliminary design, poised to serve as the foundational framework for the subsequent stages of the research endeavor.

Sequentially, the endeavor moved towards artifact design, rooted in the proposed tentative solutions. Herein, the process of development and evaluation ensued, primarily deducing in nature. This iterative design journey circled back from awareness to suggestion, development, and evaluation, ultimately culminating in the improvement of the real-world scenario, as indicated by the circumscribed arrows depicted in Figure 3-2. The culmination of this design process materialized in drawing conclusions, signifying the fulfillment of the design science

research processes. The schematic depiction of this comprehensive reasoning methodology within design science research is illustrated in the accompanying figure.

***Figure 3.2**:* Design Research Methodology (DSR)

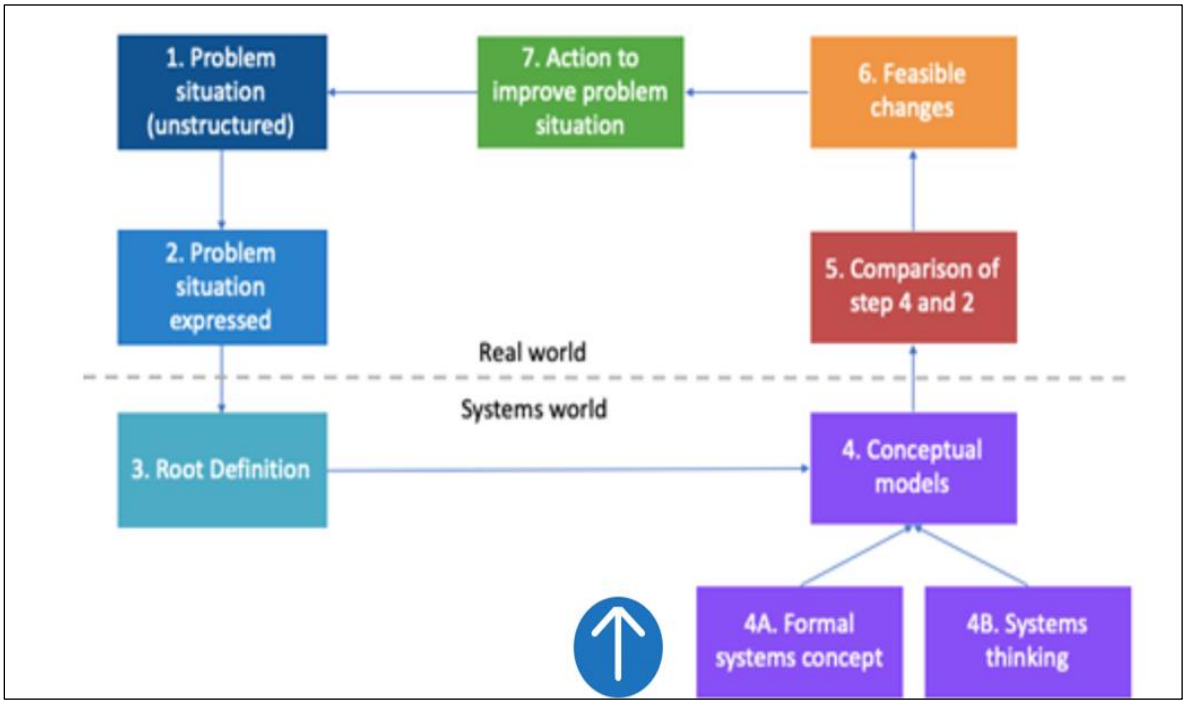


3.17.2. Soft System Methodology (SSM)

SSM finds prominent utilization among managers & consultants engrossed in the intricate realm of technical and organizational predicaments, with the Information Technology/Information Systems sector standing as a particularly fertile ground for its application. This methodology furnishes a robust framework for the methodical structuring, analytical exploration, and resolution of challenges existing within systems that are inherently entwined with human dynamics. At its core, SSM amalgamates logical, cultural, and political analyses of a given problem scenario, culminating in the formulation, discourse, and subsequent execution of actions intended to enhance the situation, with the collective accord of all involved stakeholders. Its potency lies in its capacity to encompass a comprehensive understanding of multifaceted scenarios, marrying technical insights with human insights to create comprehensive solutions.

In the broader context of problem-solving, SSM embodies a systems-based approach that extends a profound comprehension of the intricate interplay between diverse components within the environment, the project, and the stakeholders. This holistic approach, underpinned by principles outlined by Cleland (1997), Meredith and Mantel (2011), and Kerzner (2017), enables the project team to grasp the interdependencies permeating the multifaceted landscape. This comprehension extends beyond mere components to encapsulate resources, materials, market dynamics, organizational requisites, and the diverse array of stakeholders. Through this holistic understanding, the project maintains a steadfast alignment with its objectives, enabling the team to wield resources and strategies optimally to achieve the most efficient and effective realization of the project's goals. This systemic vantage point not only fosters a comprehensive comprehension but also ensures that the project's trajectory remains steadfastly aligned with its overarching vision, nurturing a streamlined and productive endeavor.

***Figure 3.3**:* System Software Methodology Seven Steps



The Soft Systems Methodology (SSM) is a structured approach to problem-solving and organizational change that acknowledges the complexity of human systems and aims to create better understanding and shared insights among stakeholders. SSM consists of a series of steps designed to systematically analyze and address complex and ill-defined problems (Checkland & Poulter, 2007). There are typically seven steps in the SSM process:

Step 1: Problem Situation Unstructured: This step involves recognizing and defining a problematic situation. It's important to note that the problem might not be well-defined at this stage, and various stakeholders might perceive the situation differently. The goal is to bring these different perceptions to light and understand the underlying issues.

Step 2: Express Problem Situation: In this step, the problem situation is depicted using rich pictures, which are graphical representations that capture various perspectives, concerns, and elements related to the problem. These visuals help stakeholders share their viewpoints and communicate their understanding of the situation.

Step 3: Root Definitions: Root definitions are concise statements that define the key components and interactions of the system in question. They capture the essential activities, actors, and relationships within the system. These definitions help identify the key aspects that need to be addressed and the relationships among them.

Step 4: Conceptual Models: In this step, conceptual models are developed to represent the interactions and dynamics of the problem situation. These models can take the form of diagrams, charts, or matrices. They help stakeholders explore the structure and behavior of the system, making its complexities more understandable.

Step 5: Comparison with Real-World: The conceptual models are then compared with the real-world situation. This step highlights discrepancies between the proposed models and the actual situation, helping to identify potential gaps in understanding and revealing areas where improvements are needed.

Step 6: Feasible and Desirable Changes: In this phase, potential changes or improvements are suggested based on the insights gained from the previous steps. These changes are not only technically feasible but also culturally and socially acceptable. The aim is to develop changes that have buy-in from stakeholders and are capable of addressing the identified issues.

Step 7: Action to Improve the Problem Situation: The final step involves selecting and implementing feasible changes to improve the problem situation. The actions are designed to align with the identified root definitions and conceptual models. The implementation process is monitored and adjusted as needed to ensure that the desired improvements are achieved.

3.18. Software Employed

This section delves into the realm of software tools harnessed in the course of this study. This segment provides an insightful overview of the various software applications that played a pivotal role in shaping the research process and analysis. Through a comprehensive exploration of the software tools employed, this section sheds light on the technological landscape that underpinned the study's execution and underscores the significance of their contributions in facilitating data management, analysis, and overall research outcomes.

3.18.1. Stata

Stata, a widely employed statistical software package, stands as an indispensable tool for researchers, analysts, and academics in various fields due to its robust capabilities in data

management, statistical analysis, and visualization. Developed by StataCorp, this software offers a comprehensive suite of features tailored to meet the intricate demands of modern research (Long& Freese, 2014).

Stata's prowess in data management is exemplified through its ability to effortlessly handle large datasets, execute data cleaning tasks, and facilitate data transformation procedures. Its user-friendly interface simplifies complex data operations, fostering efficiency in handling intricate data structures. With data organization at the forefront, Stata enables researchers to preprocess and manipulate data with precision, laying a strong foundation for subsequent analyses (Kohler & Kreuter, 2012).

In the realm of statistical analysis, Stata's versatility shines through its expansive range of statistical procedures. From basic descriptive statistics to advanced regression models, survival analysis, panel data estimations, and time series analyses, Stata offers a spectrum of tools catering to diverse analytical needs. Its adaptability to different research paradigms and statistical techniques makes it an indispensable asset for researchers aiming to derive meaningful insights from their data (Brooks& Mackinlay, 2019).

3.18.2. Visual Paradigm

The framework model's development was based on the Design Science research approach (DSR), which provided a solid foundation for the project. The DSR approach was further enhanced by incorporating systemic-holistic and socio-technical perspectives, such as the utilization of the soft systems methodology (SSM). In order to effectively capture and visualize the intricate details of the framework, the prototyping tool Visual Paradigm version 17 was utilized, enabling the creation of a visually appealing and user-friendly representation. This

combination of research methodologies and technological tools ensured a seamless and efficient development process, ultimately resulting in a robust and comprehensive framework model.

Visual Paradigm provides a comprehensive set of tools and features that can contribute to the development of a successful framework for implementing electronic services in higher learning institutions. By leveraging its diagramming, modeling, collaboration, and documentation capabilities, institutions can effectively plan, design, and manage the implementation process while ensuring the alignment of electronic services with the institution's goals and stakeholders' needs.

3.19. Ethical Consideration

Several ethical principles hold substantial consensus, including accurate analysis and reporting, as underscored by Bhattacherjee (2012).With these ethical foundations in mind, the researcher of this thesis conscientiously approached each principle, ensuring their application in the following manner.

The principle of voluntarism and non-harm: Participating in the study were unequivocally apprised of their voluntary involvement, maintaining their autonomy to withdraw from the study without encountering detrimental repercussions. Additionally, the assurance was extended that their well-being would remain unaffected by their involvement in the study. In accordance with this principle, respondents were granted the liberty to engage with the provided questionnaire at their discretion, fostering a sense of free choice.

Anonymity and confidentiality: To uphold subjects' interests and safeguard their future welfare, their identities were vigilantly shielded throughout the scientific investigation. Anonymity and confidentiality were woven into this protective fabric. Anonymity ensured that

responses could not be attributed to specific individuals, even in the final research report. Alternatively, confidentiality guaranteed that while the researcher could associate responses with individuals, their identities would remain undisclosed in any subsequent report or public forum. This level of confidentiality was maintained through measures such as omitting the need for respondents to provide their names on the questionnaire and assuring them that their identities would remain protected even during face-to-face interviews.

Disclosure: The scholar adhered to the ethical obligation of furnishing potential subjects with pertinent information about the study before data collection. This practice empowered individuals to make informed decisions about participation, understanding details such as the study's conductor, objectives, anticipated outcomes, and beneficiaries of the results. In alignment with this ethical principle, the content and purpose of the study were transparently communicated to the participants. Furthermore, the potential benefits arising from the research were openly disclosed, cementing the researcher's commitment to transparency.

Analysis and reporting: The researcher's ethical obligations extended to the way data was analyzed and reported to the scientific community. This commitment ensured that the information shared was authentic and unbiased, avoiding any potential distortion or misrepresentation. In alignment with ethical standards, the analysis and reporting stages maintained integrity, thereby contributing to the accuracy and credibility of the study's findings.

In essence, the researcher's ethical compass steered the course of the study, ensuring that each step was guided by principles of respect, transparency, and responsibility towards the participants, the scientific community, and the research process itself.

CHAPTER 4:RESULTS AND DISCUSSION

4.1. Introduction

Here in Chapter four, the outcomes and deliberations of the study come to the forefront, encompassing a comprehensive exploration of various dimensions. The investigation delves into the domain of students' attitudes towards the implementation of E-services, scrutinizes the actual operationalization of E-services in practice, dissects the multifaceted determinants that wield influence over E-service implementation, casts a forward-looking gaze upon the prospects that lie ahead for E-service integration, and develop a Model of E-Service implementation for Ethiopian Higher Institutions.

The chapter unfolds with a systematic division into six distinct sections, each tailored to illuminate a specific facet of the study's terrain. The initial section meticulously outlines the socio-demographic background of the sampled respondents. Proceeding forth, the second segment embarks on an exploration of students' attitudes towards the integration of E-services. Similarly, the subsequent section unveils an assessment of the practical implementation of E-services. The narrative then navigates towards the fourth section to identify factors that wield influence over the implementation of E-services. The fifth section dedicated to gauging the future prospects of E-service implementation. Finally, the chapter culminates in its sixth section develop a Model of E-Service implementation for Ethiopian Higher Institutions. Through this meticulous organization, the chapter adeptly illuminates various dimensions of the study, unraveling insights through the adept application of statistical analyses.

4.2. Background Characteristics of Respondents

The examination of respondents' background characteristics holds pivotal significance in comprehending the profile encompassed within the study's ambit. In alignment with this imperative, a thorough analysis of pertinent attributes including gender, age, batch, program, and field of study has been meticulously conducted and subsequently elucidated through Tables 4.1 and 4.2, furnished below. These tabular presentations not only encapsulate the essence of the participants' demographic particulars but also offer a structured visual representation that facilitates the assimilation of this crucial information.

Table 4.1:*Demographic Characteristics of Respondents*

Variables	Categories	Frequency	Percentage
Gender	Male	239	65.7
	Female	125	34.3
	Total	364	100
Age of respondent	25-34	17	4.7
	35-44	178	48.9
	45-54	136	37.4
	55-64	33	9.1
	Total	364	100

Source: Own survey data, 2021

As delineated in Table 4.1, within the cohort of 364 respondents, 65.7% emerges as male participants, while the remaining 34.3% are represented by their female counterparts. This

statistical portrayal distinctly underscores a notable prevalence of male respondents, signifying a numerical preponderance vis-à-vis their female counterparts within the sampled population.

The age distribution among the sampled respondents served as a significant demographic variable, unveiling distinctive trends. Notably, a substantial proportion (48.9%) of participants fell within the age bracket of 35-44, while an appreciable 37.4% were situated within the 45-54 age range. The remaining segments of the cohort were distributed as follows: 9.1% within the age group of 25-34 years, and 4.7% among those aged 55-64. This demographic overview paints a nuanced picture of the age composition within the sample, accentuating the pronounced presence of respondents within the 35-54 age range, while also accounting for those in the adjacent age categories.

Table 4.2:*Student Profile: Batch, Program, and Stream of Study*

Variables	Categories	Frequency	Percentage
Batch	First year	140	38.5
	Second year	212	58.2
	Third year	12	3.3
	Total	364	100
Program	Regular	176	48.4
	Weekend	147	40.4
	Summer	41	11.3
	Total	364	100
Stream field of study	Social science	230	63.2
	Natural science	51	14.0
	Engineering and technology	83	22.8
	Total	364	100

Source: Own survey data, 2021

Aligned with the breakdown based on respondents' respective batches, the outcomes delineated in Table 4.2 affirm a discernible pattern. Notably, a significant share of 58.2% was attributed to second-year students, followed by 38.5% representing first-year students. The residual fraction, constituting 3.3%, pertained to third-year students. Evidently, these findings underscore the preeminence of second-year students, signifying the most abundant demographic cohort within the sampled populace.

Turning attention to the realm of participants' academic pursuits, an illuminating breakdown is unveiled. In relation to the diverse programs undertaken, it emerges that a notable 48.4% were enrolled in the regular program, while a significant contingent of 40.4% were engaged in the weekend program. The residual fraction, comprising 11.3%, encompassed individuals enrolled in the summer program. This distribution distinctly underscores the predominant presence of respondents within the regular program, denoting a substantial cohort pursuing their educational endeavors through this mode.

Furthermore, delving into the spectrum of respondents' stream fields of study, a discernible delineation comes to the fore. Specifically, a commanding majority of 63.2% aligned themselves with the social science stream, whereas 22.8% identified with the domain of engineering and technology. The remaining 14% were situated within the realm of natural science. These insights collectively illuminate the diverse scholastic paths that the respondents traverse, with the prominence of social science and the additional representation of engineering and technology and natural science streams contributing to the textured mosaic of academic orientations.

4.3. Attitude of Students towards E-service Implementation

Within this thematic domain, the focus was centered on the meticulous analysis of questions compiled through Likert items. The researcher employed descriptive statistics, specifically frequency and percentage computations, to scrutinize individual items within each variable. Given that individual Likert item data assume a categorical nature, they were analysed using frequency and percentage (Subedi, 2016). Moreover, to encapsulate and succinctly represent the synthesized items – constituting Likert scale data standard deviation and mean were strategically harnessed (Edmindson, 2005). It's noteworthy that this assumption serves as a common convention within empirical research. Conforming to this premise, the paper aptly employs mean and standard deviation as optimal metrics for analysis, buttressed by the mean range framework advanced by Al-Sayaad et al. (2006, cited in Bassam, 2013), as depicted in the accompanying table. This methodical choice underscores the comprehensive effort undertaken to meaningfully assess and interpret the array of Likert-scale-based responses, thus fortifying the depth of the study's analytical rigor.

Table 4.3: Mean Range of Five-Point Likert Scale Ratings

Mean	Response
1.00 - 1.79	Strongly Disagree
1.80 - 2.59	Disagree
2.60 - 3.39	Neutral
3.40 - 4.19	Agree
4.20 - 5.00	Strongly Agree

Source: Al-Sayaad et al. (2006)

The insights conveyed by Table 4.3 unveil a systematic classification scheme predicated upon the computed mean scores. These ranges of values deftly delineate the interpretative landscape:

if the mean score resides within the interval of 1.0 to 2.6, the inference corresponds to a stance of disagreement; in the realm between 2.6 and 3.4, the disposition tilts towards neutrality; whereas a mean score exceeding 3.4 signifies alignment with the perspective of agreement. This strategic maneuver not only facilitates a comprehensive understanding of the participants' viewpoints but also exemplifies a methodical approach to transforming quantitative data into meaningful qualitative insights.

Table 4.4: *Attitude of Respondents towardsE-Services Ease of Use*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-services are easier to use than traditional services.	37	10.2	156	42.9	75	20.6	71	19.5	25	6.9
2	Students should use e-services to make their lives easier.	80	22.0	119	32.7	39	10.7	105	28.8	21	5.8
3	E-services make it easy to access information and complete tasks.	62	17.0	164	45.1	68	18.7	40	11.0	30	8.2
4	Students can get information from the university website without coming to campus.	52	14.3	166	45.6	68	18.7	58	15.9	20	5.5
5	Students can complete administrative & academic tasks electronically.	84	23.1	199	54.7	29	8.0	37	10.2	15	4.1
Overall mean (SD)		2.50(.664)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Centered on item 1, the outcomes delineated in Table 4.4 cast a spotlight on the participants' viewpoints. Evidently, a notable proportion of 53.1% expressed dissent, asserting that E-services do not seamlessly deliver their required necessities in comparison to the conventional service acquisition approach. In contrast, a segment of 26.4% voiced concurrence with this notion. This

verdict resoundingly echoes the sentiment that a predominant fraction of the surveyed respondents diverge from the notion that E-services offer a facile means of accessing their requisites, when juxtaposed against the traditional service-seeking paradigm. This observation reinforces the prevailing perspective that a significant number of participants are inclined to contest the efficiency of E-services in catering to their demands, underscoring the need for further exploration and refinement within this domain.

In the context of item 2, the insights gleaned from Table 4.4 come to the forefront, shedding light on participant perspectives. It becomes evident that a notable contingent of 54.7% held a contrary view, indicating disagreement with the assertion that every student ought to embark on utilizing E-services to facilitate their routines. In contrast, a segment of 34.6% aligned themselves with this notion. The outcome underlines the prevalent sentiment that a substantial majority within the respondent pool is disinclined to endorse the notion that E-service adoption universally simplifies daily routines for students, thus illustrating a distinct reluctance towards wholehearted acceptance of such a proposition. This divergence underscores the intricacies surrounding the perceived effectiveness of E-services in enhancing routine management, warranting further investigation and comprehension.

Pertaining to item 3, the implications discerned from Table 4.4 come into view, casting a spotlight on participant perceptions. Notably, a significant 62.1% of the respondents expressed discord, indicating that they do not concur with the notion that utilizing E-services facilitates facile access to their desired outcomes. In contrast, a lesser fraction of 19.2% aligned themselves with this perspective. These findings underscore the prevailing sentiment that a substantial majority within the sampled population is inclined to repudiate the idea that E-service employment seamlessly enhances their ability to attain desired objectives, thereby accentuating

the prevailing skepticism concerning the efficacy of such platforms in streamlining access. This observation not only emphasizes the nuanced complexities entwined with E-service utilization but also underscores the necessity for an in-depth inquiry into the factors that contribute to this divergence.

In connection with item 4, the insights furnished by Table 4.4 come to the fore, unveiling participant sentiments. It becomes evident that a substantial proportion of 59.9% voiced dissent, indicating that they do not concur with the assertion that, as students, they can seamlessly acquire information from the university website without necessitating a physical presence on campus. In contrast, a lesser proportion of 21.4% subscribed to this viewpoint. This outcome accentuates the prevailing inclination within the sampled populace to contest the notion that the university website is a comprehensive repository of information, sufficient to circumvent the need for physical presence on campus. This divergence reinforces the intricate dynamics concerning information accessibility via digital platforms and underscores the necessity to scrutinize the multifaceted factors influencing students' perceptions and behaviors.

Focusing on item 5, the insights derived from Table 4.4 come into focus, illuminating the sentiments of the participants. Notably, a substantial 77.8% of the respondents expressed dissent, underscoring their lack of alignment with the assertion that they can seamlessly accomplish administrative and academic tasks through electronic means. In contrast, a smaller fraction of 14.3% concurred with this notion. This outcome resoundingly echoes the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to reject the idea that electronic platforms readily facilitate the completion of administrative and academic functions. This divergence underscores the complexities inherent in the electronic transition of such

activities and amplifies the need for a deeper exploration into the underlying factors influencing these attitudes and behaviors.

The insights gleaned from Table 4.4 spotlight a comprehensive overview of participants' perspectives. Specifically, the aggregate mean value for the "ease of use" criterion registers at 2.5, accompanied by a standard deviation of 0.664. This calculated value substantiates the inference that the mean falls below the threshold of 2.6, a demarcation established within the framework of Al-Sayaad et al.'s (2006) proposed methodology, which designates this range as indicative of a level of disagreement. This outcome distinctly conveys that the respondents encompassed in the study perceive the facet not to be aligned with their anticipated expectations. This conclusion underscores a noteworthy misalignment between the perceived user-friendliness of the services under examination and the respondents' anticipations, thereby signifying the need for a closer exploration of this aspect to facilitate a more streamlined user experience.

Table 4.5: *Attitude of Respondents on E-services Content and Appearance of Information*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-service implementation makes the information clear	43	11.8	166	45.6	76	20.9	57	15.7	22	6.0
2	The presence of E-service help to get up-to-date information	68	18.7	145	39.8	91	25.0	33	9.1	27	7.4
3	Students can easily get information at their own pace	77	21.2	152	41.8	77	21.2	42	11.5	16	4.4
4	There are contents at the web-cite	0	0.0	34	9.3	49	13.5	239	65.7	42	11.5
5	Their university e-services platforms are user friendly	5	1.4	47	12.9	60	16.5	219	60.2	33	9.1

Overall mean (SD)	2.97(.533)

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Aligned with item 1, the insights extracted from Table 4.5 take center stage, unveiling participant perspectives. It becomes apparent that a substantial 57.4% of the respondents conveyed dissent, signifying their lack of concurrence with the notion that the implementation of E-services leads to enhanced clarity of information for them. Conversely, a smaller segment of 21.7% aligned themselves with this viewpoint. This outcome underlines the prevailing sentiment among the surveyed cohort – that a significant majority is inclined to contest the assertion that the integration of E-services enhances the comprehensibility of information. This divergence serves as a poignant indication of the intricacies surrounding the anticipated clarity benefits of E-service implementation and underscores the necessity to delve deeper into the underlying factors influencing these perceptions.

Regarding item 2, as succinctly outlined in Table 4.5, a notable 58.5% of the respondents expressed dissent, indicating their divergence from the perspective that the integration of E-services contributes to accessing up-to-date information. In contrast, a smaller faction of 16.5% embraced this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort that a significant majority tends to contest the assertion that E-service implementation inherently aids in attaining current information. This observed disparity accentuates the complexities intertwined with the role of E-services in providing timely information, warranting a more profound exploration into the factors contributing to these perceptions.

In relation to item 3, as succinctly synthesized in Table 4.5, a substantial 63% of the respondents expressed dissent, indicating their lack of concurrence with the notion that students can

seamlessly acquire information at their individualized pace through E-service implementation. Conversely, a smaller fraction of 15.9% aligned themselves with this viewpoint. This observation underscores the prevailing sentiment among the sampled cohort – that a significant majority is inclined to challenge the assertion that E-service integration inherently enables students to access information at their preferred rhythm. This divergence reinforces the intricacies surrounding the perceived adaptability and convenience of E-service-based information retrieval, prompting further inquiry into the factors shaping these opinions.

Concerning item 4, as succinctly captured in Table 4.5, a substantial 77.2% of the respondents voiced agreement, affirming the presence of content on the E-services platform. In contrast, a smaller contingent of 9.3% held a contrary view. This outcome effectively highlights the prevailing sentiment within the surveyed cohort that a significant majority attests to the existence of content within their university E-services platforms. This finding reinforces the notion that the platforms are substantively populated with pertinent material.

Shifting focus to item 5, it is evident from Table 4.5 that a notable 69.3% of the respondents concurred, indicating that their university's E-services platforms exhibit user-friendliness. In contrast, a minor segment of 14.3% expressed disagreement. This outcome resonates with the prevailing sentiment among the surveyed participants that a substantial majority finds their university E-services platforms to be adeptly designed for user-friendly interaction. This perception highlights the integral role of usability in shaping their experiences and underscores the necessity to continually enhance these platforms to meet users' expectations.

As succinctly encapsulated in Table 4.5, the collective mean value for "content and appearance of information" is calculated at 2.97, accompanied by a standard deviation of 0.533. This

computed value corroborates the inference that the mean score falls below the established threshold of 2.6, as defined within Al-Sayaad et al.'s (2006) framework. This specific range is indicative of a neutral stance. Consequently, it can be deduced that the participants within the study area perceive the "content and appearance of information" aspect as being suboptimal. The observation highlights the need for a more comprehensive assessment and potential improvements in the content and appearance of e-services platforms.

Table 4.6: *E-Services Functionality and Interaction Environment*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-service implementation helps me to save time and energy	73	20.1	163	44.8	62	17.0	32	8.8	34	9.3
2	E-service facilitate interaction among students	12	3.3	18	4.9	77	21.2	187	51.4	70	19.2
3	As a student, I can get academic and administrative related services from anywhere as the distance is not a factor	0	0.0	56	15.4	100	27.5	180	49.5	28	7.7
4	E-learning is an innovative approach and must be encouraged	1	0.3	23	6.3	69	19.0	223	61.3	48	13.2
5	As a student, I like the idea of all types of E-services	127	34.9	158	43.4	48	13.2	21	5.8	10	2.7
Overall mean (SD)		3.10(.494)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Turning to item 1, as succinctly outlined in Table 4.6, a notable 64.9% of the respondents expressed dissent, signifying their lack of alignment with the notion that the implementation of E-services translates into time and energy savings. In contrast, a smaller faction of 18.1%

endorsed this viewpoint. This outcome underscores the prevailing sentiment within the sampled cohort that a significant majority tends to contest the assertion that E-service implementation inherently leads to conserving time and energy. This observation highlights the intricate dynamics surrounding the anticipated efficiency benefits of E-services and underscores the necessity to delve deeper into the underlying factors influencing these perceptions.

Regarding item 2, as succinctly synthesized in Table 4.6, a substantial 70.6% of the respondents expressed agreement, indicating that they perceive E-services as a facilitator of interaction among students. In contrast, a smaller segment of 8.2% held a contrary view. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to endorse the notion that E-services play a role in fostering interaction among students. This observation signifies the perceived potential of E-services to serve as a platform for student engagement and collaboration, warranting a deeper exploration into the dynamics and implications of this interaction-enhancing feature.

In relation to item 3, as effectively summarized in Table 4.6, a notable 57.2% of the respondents expressed agreement, affirming their belief that, as students, they possess the capability to access academic and administrative services from any location, with distance being a non-limiting factor. In contrast, a smaller fraction of 15.4% held a differing perspective. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to endorse the notion that E-services afford them the flexibility to obtain essential academic and administrative services irrespective of geographical distance. This observation underlines the perceived role of E-services in transcending physical barriers, facilitating accessibility, and empowering students in their educational pursuits.

Regarding item 4, as succinctly summarized in Table 4.6, a significant 74.5% of the respondents expressed agreement, underscoring their belief that E-learning constitutes an innovative approach that warrants encouragement. In contrast, a smaller fraction of 6.6% held an opposing view. This outcome effectively underscores the prevailing sentiment within the surveyed cohort that a substantial majority is inclined to endorse the notion that E-learning is a pioneering method that merits active promotion. This observation reflects the participants' recognition of the potential benefits and progressive nature of E-learning as an educational paradigm, highlighting the need for continued support and implementation of such approaches.

Turning to item 5, as succinctly synthesized in Table 4.6, a notable 78.3% of the respondents conveyed dissent, signifying their lack of alignment with the notion that, as students, they hold a positive disposition towards all categories of E-services. In contrast, a smaller segment of 8.5% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort that a substantial majority tends to contest the assertion that they uniformly favor all varieties of E-services.

The aggregate mean value for "functionality and interaction environment" stands at 3.10, coupled with a standard deviation of 0.494. This calculated value corroborates the deduction that the mean score surpasses the established threshold of 2.6, as established within Al-Sayaad et al.'s (2006) framework. This particular range signifies a neutral stance. Consequently, it can be inferred that the respondents within the study area perceive the "functionality and interaction environment" aspect as falling short of their anticipated expectations.

4.4. The Practices of E-service Implementation

In this report, we describe the results of an examination of data acquired from actual E-service deployment. It measures how people feel about several aspects of having a presence online, including communication, commerce, change, and networked/integrated presence. The results are shown in Tables 4.7 through 4.11.

Table 4.7: *Perception of Respondents on Web presence*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	The university website is a comprehensive resource for students, faculty, and staff.	0	0.0	6	1.6	15	4.1	218	59.9	125	34.3
2	The website provides access to a variety of information including downloadable documents, programs, calendars, schedules, e.t.c	0	0.0	7	1.9	30	8.2	164	45.1	163	44.8
3	The website is regularly updated to ensure that it is always up-to-date.	132	36.3	143	39.3	69	19.0	13	3.6	7	1.9
4	The university website is a comprehensive resource for students, faculty, and staff.	4	1.1	51	14.0	15	4.1	232	63.7	62	17.0
Overall mean (SD)		3.59(.396)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Turning attention to item 1, as effectively portrayed in Table 4.7, a substantial 94.2% of the respondents expressed agreement, signifying their belief that the university maintains an updated

and functional official website. In contrast, a smaller fraction of 1.6% held a differing perspective. This outcome emphasizes the prevailing sentiment within the surveyed cohort – which an overwhelming majority tends to endorse the notion that the university's official website is consistently kept current and functional. This observation underscores the participants' confidence in the university's digital presence, highlighting the significance of an up-to-date and smoothly operating website in fostering positive perceptions and interactions.

Regarding item 2, as effectively conveyed in Table 4.7, a notable 89.9% of the respondents expressed agreement, signifying their belief that the university website provides visitors with the capability to download various documents from the platform. In contrast, a smaller faction of 1.9% held an opposing view. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to endorse the notion that the university's website facilitates the downloading of a diverse array of documents. This observation underscores the utility of such a feature in enhancing user convenience and access to pertinent resources, thereby contributing to a positive online experience for visitors.

Focusing on item 3, as effectively encapsulated in Table 4.7, a significant 75.6% of the respondents conveyed dissent, signifying their lack of concurrence with the notion that the university's website offers access to programs, calendars, and schedules. In contrast, a smaller segment of 5.5% aligned themselves with this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that the university's website sufficiently hosts programs, calendars, and schedules. This observation reflects a potential gap in information provision on the website, warranting an exploration into the factors contributing to the perceived absence of these crucial resources on the digital platform.

Shifting focus to item 4, as succinctly outlined in Table 4.7, a notable 80.7% of the respondents expressed agreement, affirming their belief that the university website provides access to updated information and news. In contrast, a smaller segment of 15.1% held an opposing view. This outcome effectively highlights the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to endorse the notion that the university's website serves as a platform for accessing timely information and news updates. This observation underscores the website's role in disseminating current and relevant information to the university community, highlighting its utility in keeping stakeholders informed and engaged.

The insights derived from Table 4.7 highlight an aggregated mean value of 3.59, accompanied by a standard deviation of 0.396. This computed value substantiates the deduction that the mean score surpasses the established threshold of 3.4, as delineated within the methodological framework proposed by Al-Sayaad et al. (2006). This particular range signifies a level of agreement. Consequently, it can be inferred that the respondents within the study area perceive the web presence to be robust and effective. This observation underscores their favorable assessment of the university's online presence, indicating that it successfully meets their expectations and serves as a valuable resource for information dissemination and engagement.

Table 4.8: *Perception of Respondents on Interaction*

		SDA	**DA**	**N**	**A**	**SA**

No.	Statements	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
1	Students and staff can access their profiles from the university website	117	32.1	187	51.4	48	13.2	9	2.5	3	0.8
2	Submission of online applications is possible	58	15.9	156	42.9	88	24.2	56	15.4	6	1.6
3	The academic progress of students submitted by teachers online.	4	1.1	42	11.5	36	9.9	211	58.0	71	19.5
4	Students can see their academic result online	120	33.0	103	28.3	52	14.3	51	14.0	38	10.4
Overall mean (SD)		2.64(.634)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

With reference to item 1, as succinctly summarized in Table 4.8, a substantial 83.5% of the respondents conveyed dissent, signifying their divergence from the notion that students and staff possess the capability to access their profiles through the university website. In contrast, a smaller segment of 3.3% endorsed this viewpoint. This observation underscores a potential limitation in the platform's functionality, warranting a deeper examination into the factors contributing to the perceived absence of this feature and the potential implications for user convenience and engagement.

Regarding item 2, as concisely depicted in Table 4.8, a notable 58.8% of the respondents expressed dissent, signifying their lack of alignment with the notion that the submission of online applications is feasible. In contrast, a smaller fraction of 17% held an opposing view. This observation accentuates potential limitations in the online application process, warranting an

exploration into the factors influencing this perceived inaccessibility and its impact on the overall user experience.

Turning attention to item 3, as succinctly outlined in Table 4.8, a substantial 77.5% of the respondents expressed agreement, signifying their belief that teachers have the capability to submit students' academic results online. In contrast, a smaller segment of 12.6% held a differing perspective. This outcome underscores the prevailing sentiment within the surveyed cohort that a significant majority is inclined to endorse the notion that the university's website facilitates the online submission of students' academic results by teachers.

Regarding item 4, as effectively summarized in Table 4.8, a notable 61.3% of the respondents conveyed dissent, signifying their lack of concurrence with the notion that students have the capability to view their academic results online. In contrast, 24.4% endorsed this viewpoint. The survey results show that most students don't think they can easily access their academic results through the university website.

The insights gleaned from Table 4.8 unveil an aggregated mean value of 2.64, accompanied by a standard deviation of 0.634. This calculated value substantiates the deduction that the mean score surpasses the established threshold of 2.6, as established within Al-Sayaad et al.'s (2006) framework. This specific range indicates a neutral stance. Consequently, it can be inferred that the respondents within the study area perceive the level of interaction within E-service implementation at the university to be somewhat less satisfactory. This observation underscores a potential gap in the quality of interaction facilitated by E-services and highlights the need to further explore and potentially enhance the mechanisms fostering engagement and communication within the digital platform.

Table 4.9: *Perception of Respondents on Transaction*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	The university and its constituents engage in a two-way exchange of services over the internet.	110	30.2	135	37.1	91	25.0	18	4.9	10	2.7
2	The university's website provides an online response to service inquiries.	1	0.3	42	11.5	59	16.2	167	45.9	95	26.1
Overall mean (SD)		2.99(.676)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Turning to item 1, as effectively encapsulated in Table 4.9, a significant 67.3% of the respondents expressed dissent, signifying their lack of alignment with the notion that the university and its constituents engage in a reciprocal exchange of services over the Internet. In contrast, a smaller fraction of 7.6% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that the university's online service interactions with stakeholders are truly bidirectional. This observation underscores a potential limitation in the interactivity of online services and prompts further exploration into the factors influencing the perceived absence of robust dialogue between the school and those who have an interest in it.

Focusing on item 2, as effectively conveyed in Table 4.9, a notable 72% of the respondents expressed agreement, signifying their belief that the university's website provides online

responses for service requests. In contrast, a smaller segment of 11.8% held an opposing view. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to endorse the notion that the university's online platform offers a mechanism for responding to service requests in an online format. This observation underscores the perceived utility of such a feature in facilitating efficient communication and problem-solving between stakeholders and the university.

The insights drawn from Table 4.9 reveal an aggregated mean value of 2.99, accompanied by a standard deviation of 0.676. This computed value substantiates the inference that the mean score falls below the established threshold of 2.6, as established within Al-Sayaad et al.'s (2006) framework. This specific range indicates a neutral stance. Consequently, it can be deduced that the respondents within the study area perceive the E-service transaction to be insufficient. This observation highlights the gap between the anticipated and realized quality of transactional interactions facilitated by E-services, indicating a potential need for improvements in this aspect of digital communication and engagement.

Table 4.10: *Perception of Respondents on Transformation*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	In order to construct an E-service, the lower-level hierarchies are connected to the higher-level system.	146	40.1	148	40.7	60	16.5	8	2.2	2	0.5
2	The E-services are interoperable across organizational boundaries.	76	20.9	169	46.4	106	29.1	11	3.0	2	0.5
3	The university and the people who have a stake in it are having a conversation online.	124	34.1	171	47.0	61	16.8	6	1.6	2	0.5
Overall mean (SD)		1.95(.540)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Turning to item 1, as succinctly outlined in Table 4.10, a significant 80.8% of the respondents conveyed dissent, signifying their lack of concurrence with the notion that the low-level hierarchies are interconnected with higher-level systems possessing similar functions within E-service implementation. In contrast, a smaller segment of 2.7% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that there exists a seamless linkage between low-level hierarchies and higher-level systems with parallel functions within E-service implementation. This observation indicates a potential gap in the integration and coordination of different levels of the E-service system, warranting a closer examination of the factors contributing to this perceived lack of alignment.

Regarding item 2, as effectively portrayed in Table 4.10, a notable 67.3% of the respondents expressed dissent, signifying their divergence from the notion that integration exists among E-services across various administrative boundaries. In contrast, a smaller segment of 3.5% endorsed this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority tends to contest the assertion that there is effective integration and coordination of E-services across diverse administrative domains. This observation emphasizes a potential gap in the interconnectedness of different E-service components, prompting further exploration into the underlying factors contributing to the perceived lack of integration and its implications for operational efficiency and user experience.

Shifting focus to item 3, as effectively outlined in Table 4.10, a significant 81.1% of the respondents conveyed dissent, signifying their lack of alignment with the notion that an online dialogue exists between the university and its stakeholders. In contrast, a smaller segment of 2.1% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that the university fosters active and meaningful online dialogues with its stakeholders. This observation underscores a potential limitation in the communication channels established between the university and its stakeholders within the digital realm, prompting further investigation into the factors influencing this perceived absence of online dialogues.

The insights derived from Table 4.10 highlight an aggregated mean value of 1.95, coupled with a standard deviation of 0.540. This calculated value substantiates the deduction that the mean score falls below the established threshold of 2.6, as delineated within Al-Sayaad et al.'s (2006) framework. This observation underlines the participants' assessment of the universities' efforts in implementing transformative changes through E-service initiatives, indicating potential areas

where improvements or enhancements are required to elevate the level of commitment to transformational endeavors.

Table 4.11: *Perception of Respondents on Networked Presence*

	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	There are online consultation services through the university website	127	34.9	160	44.0	57	15.7	19	5.22	1	0.3
2	The university has a well-designed website and other platforms like Facebook and you tube accounts in addition to a website for delivering E-services	137	36.8	147	40.4	68	18.7	14	3.9	1	0.3
3	The e-services platforms facilitate the interaction between students and instructors as well as administrators	113	31.0	166	45.6	64	17.6	19	5.2	2	0.6
Overall mean (SD)		1.94(.564)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Regarding item 1, as effectively encapsulated in Table 4.11, a substantial 78.9% of the respondents conveyed dissent, signifying their divergence from the notion that online consultation services are available through the university's website. In contrast, a smaller segment of 5.5% endorsed this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority tends to contest the assertion that the

university provides accessible online consultation services through its website. This observation highlights a potential limitation in the provision of online consultation services, warranting an exploration into the factors shaping this perceived absence and its potential impact on stakeholder engagement and support.

Concerning item 2, as succinctly portrayed in Table 4.11, a notable 77.2% of the respondents expressed dissent, signifying their lack of alignment with the notion that the university possesses a well-designed website and additional platforms such as Facebook and YouTube accounts for delivering E-services. In contrast, a smaller segment of 4.2% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a significant majority tends to contest the assertion that the university's digital infrastructure is adequately equipped with well-designed websites and complementary platforms for E-service delivery. This observation points to a potential gap in the integration of various digital channels for service provision, prompting further exploration into the factors contributing to this perceived limitation and its implications for the accessibility and effectiveness of E-service delivery.

Regarding item 3, as effectively summarized in Table 4.11, a substantial 76.6% of the respondents conveyed dissent, signifying their lack of concurrence with the notion that the E-services platforms effectively facilitate interactions between students, instructors, and administrators. In contrast, a smaller segment of 5.8% endorsed this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant majority tends to contest the assertion that the E-services platforms serve as efficient tools for fostering interactions among key stakeholders within the academic community. This observation emphasizes a potential gap in the functionality and effectiveness of the platforms in promoting

collaborative engagement, prompting further exploration into the factors contributing to this perceived lack of interaction facilitation.

The insights gleaned from Table 4.11 unveil an aggregated mean value of 1.94, coupled with a standard deviation of 0.564. This computed value substantiates the inference that the mean score falls below the established threshold of 2.6, as delineated within Al-Sayaad et al.'s (2006) framework. This specific range signifies a level of disagreement. Consequently, it can be deduced that the respondents within the study area perceive the networked presence, particularly concerning aspects of online consultation services, well-designed digital platforms, and interaction facilitation, to be rather inadequate. This observation underscores the participants' assessment of the universities' efforts in establishing an effective and comprehensive online networked presence, indicating potential areas for improvement and enhancement to elevate the level of engagement and interaction among stakeholders.

4.5. Factors that Influence E-service Implementation

Within this topic, a comprehensive descriptive summary of the study variables was provided, shedding light on the various dimensions and aspects under investigation. This encompassed the attitudes towards E-service implementation, the practice of E-service implementation, factors influencing E-service implementation, prospects of E-service implementation, and other pertinent variables relevant to the study. The interrelationships between these variables were analyzed, elucidating how they interact and influence each other within the context of E-service implementation in the university setting. Additionally, the focus extended to examining how independent variables exerted their effects on the dependent variable, revealing the intricate web of factors that contribute to the overall dynamics of E-service adoption and utilization within the

academic environment. This comprehensive analysis served to provide a nuanced understanding of the multifaceted relationships and impacts associated with E-service implementation, guiding insights for further exploration and potential enhancements in this domain.

4.5.1. Descriptive Summary of Study Variables

In this specific sub-topic, a detailed descriptive summary of both the independent and dependent variables was expounded upon. The characteristics, attributes, and variations of each variable were presented and analyzed, shedding light on their individual properties within the context of the study. The findings related to these variables were systematically organized and visually presented in Tables 4.12 through 4.16, which encapsulated the data in an accessible format for better comprehension. This comprehensive presentation of the descriptive aspects of the variables offered valuable insights into their distribution, trends, and key characteristics, setting the foundation for the subsequent analyses and discussions on the interrelationships and effects of these variables within the study framework.

Table 4.12: *Perception of Respondents on their E-service Usage Capacity*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-Services implementations have student participation.	91	25.0	158	43.4	44	12.1	59	16.2	12	3.3
2	Students have the cognitive capacity to use the E-Services.	12	3.3	147	40.4	76	20.9	107	29.4	22	6.0
3	Implementing E-Services requires students to have the technical abilities to do so.	26	7.1	202	55.5	85	23.4	37	10.2	14	3.8
4	Students have awareness regarding E-Services implementation	31	8.5	178	48.9	89	24.5	54	14.8	12	3.3
5	Students can complete the E-Services tasks by themselves	57	15.7	155	42.6	88	24.2	45	12.4	19	5.2
6	Students do not go to an office for asking the service delivered online	11	3.0	45	12.4	65	17.9	155	42.6	88	24.2
Overall mean (SD)		2.75(.477)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Focusing on item 1, as effectively encapsulated in Table 4.12, a significant 68.4% of the respondents expressed dissent, signifying their divergence from the notion that students are actively engaged in the activities related to E-service implementations. In contrast, a smaller segment of 19.5% endorsed this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that students play an active role in the various activities associated with the implementation of E-services. This observation highlights a potential gap in student involvement and engagement in shaping and facilitating E-service initiatives, prompting further investigation into the factors contributing to this perceived lack of participation and its implications for the overall effectiveness of E-service implementation efforts.

Turning attention to item 2, as effectively outlined in Table 4.12, a notable 43.7% of the respondents conveyed dissent, signifying their lack of concurrence with the notion that students possess the capability to process information effectively within the context of E-service implementation. In contrast, a slightly larger segment of 35.4% endorsed this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a substantial portion tends to contest the assertion that students are adequately equipped to process the information presented through E-services. This observation emphasizes a potential gap in the alignment between students' skills and the demands of E-service utilization, warranting further exploration into the factors influencing this perceived disparity and its impact on students' ability to effectively navigate digital platforms for their educational needs.

Turning to item 3, as succinctly portrayed in Table 4.12, a significant 62.6% of the respondents conveyed dissent, signifying their lack of alignment with the notion that students possess the necessary technical skills to effectively utilize E-service implementations. In contrast, a smaller

segment of 14% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that students are adequately equipped with the technical competencies required to navigate and make the most of E-service implementations. This observation emphasizes a potential gap in students' technical readiness for engaging with digital platforms, prompting further exploration into the factors influencing this perceived deficiency and its implications for their effective use of E-services in their academic journey.

Turning to item 4, as effectively encapsulated in Table 4.12, a notable 57.4% of the respondents conveyed dissent, signifying their lack of alignment with the notion that students possess sufficient awareness regarding E-service implementation. In contrast, a smaller segment of 18.1% endorsed this viewpoint. This outcome underscores the prevailing sentiment within the surveyed cohort – that a significant portion tends to contest the assertion that students are adequately informed and aware of the various aspects of E-service implementation. This observation highlights a potential gap in students' awareness and understanding of the functionalities and benefits of E-services, warranting further exploration into the factors influencing this perceived lack of awareness and its potential impact on their engagement with digital platforms for educational purposes.

Focusing on item 5, as effectively summarized in Table 4.12, a significant 58.3% of the respondents expressed dissent, signifying their divergence from the notion that students can independently complete E-service tasks. In contrast, a smaller segment of 17.6% endorsed this viewpoint. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a substantial majority tends to contest the assertion that students possess the capability to autonomously carry out tasks within the realm of E-service utilization. This

observation points to a potential gap in students' self-sufficiency and confidence when engaging with E-services, warranting further exploration into the factors contributing to this perceived limitation and its implications for their ability to navigate and leverage digital platforms effectively for various academic tasks.

Regarding item 6, as effectively summarized in Table 4.12, a notable 66.8% of the respondents expressed agreement, affirming their belief that students do not need to physically visit an office to request services that are delivered online. In contrast, a smaller segment of 15.4% held a differing perspective. This outcome effectively underscores the prevailing sentiment within the surveyed cohort – that a significant majority is inclined to endorse the notion that E-services negate the necessity for students to visit physical offices for service-related inquiries. This observation underlines the perceived shift towards online accessibility and convenience, highlighting the potential of E-service implementation to transform traditional administrative interactions within the university setting.

Summarizing the findings from Table 4.12, the computed overall average value for E-service usage capacity stands at 2.75, accompanied by a standard deviation of 0.477. This calculated mean value falls below the established threshold of 2.6, as defined within Al-Sayaad et al.'s (2006) framework. This specific range signifies a neutral standpoint. Consequently, it can be inferred that the sampled respondents within the study area perceive their E-service usage capacity to be less than optimal. This observation underscores the participants' assessment of their readiness and competence in effectively utilizing E-services, highlighting potential areas for improvement and the need to enhance their ability to leverage digital platforms for various academic tasks and interactions.

Table 4.13: *Perception of Respondents on Top Managerial Commitment*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	The university managers give support concerning E-Services implementation	9	2.5	122	33.5	107	29.4	111	30.5	15	4.1
2	The administration and the many groups with an interest in the institution are in constant, two-way dialogue.	71	19.5	151	41.5	86	23.6	46	12.6	10	2.7
3	The administration is tightening its grip on the collegiate bureaucracy.	10	2.7	154	42.3	90	24.7	102	28.0	8	2.2
4	The university's top managers allocate responsibilities	82	22.5	148	40.7	82	22.5	43	11.8	9	2.5
5	E-service adoption at the institution has the backing of the administration.	65	17.9	164	45.1	98	26.9	28	7.7	9	2.5
6	In order to deploy E-services, the university administration set out objectives, strategies, policies, plans, and baselines.	74	20.3	178	48.9	84	23.1	23	6.3	5	1.4
Overall mean (SD)		2.51(.529)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Aligned with the details presented in item 1, the findings extracted from Table 4.13 underscore a noteworthy aspect: a significant 36% of the individuals sampled exhibited disagreement towards the extent of support provided by university managers regarding the implementation of E-Services, contrasting with the 34.6% of respondents who expressed their alignment with this notion.

Regarding item 2, the insights gleaned from Table 4.13 shed light on a distinct pattern: a substantial 61% of the respondents sampled conveyed a sense of disagreement concerning the existence of an open and reciprocal communication framework connecting university managers and the institution's stakeholders. This contrasts notably with the more modest 15.3% who voiced their concurrence with this notion. Evidently, these findings emphasize a prevailing sentiment among the sampled respondents, underscoring a widespread perception that an unobstructed, bidirectional communication conduit linking university managers and the university's stakeholders is lacking.

Regarding the matter addressed in item 3, as succinctly outlined in the encapsulating details of Table 4.13, a notable observation comes to the fore: a considerable 45% of the individuals participating in the survey expressed their disagreement regarding the assertion that the upper echelons of management are effectively upholding control uniformly across every stratum of the university's organizational structure. In contrast, a lesser yet discernible 30.2% of respondents signified their alignment with this notion. Clearly, these findings underscore a prevailing sentiment among the sampled participants, shedding light on a prevailing perspective that the top-tier management's capacity to ensure consistent control across the entire expanse of the university's organizational hierarchy is met with skepticism by the majority.

Delving into the subject of item 4 in Table 4.13, a salient observation commands attention: a substantial 63.2% of the participants sampled in the study conveyed their disagreement concerning the proposition that the highest-ranking managers within the university efficaciously distribute responsibilities. In contrast, a more modest yet discernible 14.3% of respondents voiced their concurrence with this perspective. This indicated that the allocation of duties by the university's managers is met with skepticism by the majority of those sampled.

Addressing the matter delineated in item 5, as succinctly encapsulated by the synopsis presented in Table 4.13, a striking observation takes center stage: a substantial 63% of the respondents who participated in the survey articulated their dissent concerning the notion that the prevailing leadership approach adopted by the uppermost echelons of the university's management lends significant support to the endeavor of implementing E-services. In contrast, a notably smaller yet discernible 10.2% of respondents voiced their concurrence with this assertion. Evidently, these findings cast a revealing light upon a predominant sentiment among the surveyed cohort, indicating a prevailing viewpoint that the prevailing leadership style embraced by the university's top management does not exhibit substantial alignment with the pursuit of E-service implementation, as perceived by the majority of the sampled respondents.

Pertaining to the subject matter expounded in item 6, as succinctly distilled from the findings illustrated within Table 4.13, a compelling revelation takes prominence: an impactful 69.2% of the participants subjected to the survey expressed their opposition to the assertion that the university's management body has effectively formulated a comprehensive framework encompassing objectives, strategies, policies, blueprints, and foundational benchmarks geared towards realizing the implementation of E-services. Conversely, a notably smaller yet discernible 7.7% of respondents signaled their concurrence with this sentiment. Clearly evident from these

outcomes is the prevailing sentiment among the surveyed populace, which signifies a widespread perspective that the university's management has not substantively established a comprehensive suite of guiding principles and actionable plans requisite for the successful integration of E-services, as evidenced by the majority of respondents within the sample.

As highlighted through the data encapsulated in Table 4.13, the aggregate average score attributed to top managerial commitment stands at 2.51, accompanied by a standard deviation of 0.529. This statistical portrayal underscores a mean value that falls below the threshold of 2.6, a benchmark indicative of a disposition towards disagreement as per the assessment criteria derived from the methodologies proposed by Al-Sayaad et al. (2006) for evaluating mean score ranges within the context of five-point Likert scale inquiries. This conclusion unmistakably signals that the individuals participating as respondents in the study's geographical domain hold a perception that the level of commitment exhibited by top management does not align with the projected or desired standard.

Table 4.14: *Perception of Respondents on ICT Infrastructure*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	The educational institution provides access to computer technology resources (both hardware and software).	11	3.0	35	9.6	76	20.9	149	40.9	93	25.5
2	The university is providing updated technologies	12	3.3	48	13.2	74	20.3	162	44.5	68	18.7
3	The university has adequate network	92	25.3	167	45.9	71	19.5	22	6.0	12	3.3

	infrastructure.										
4	There is internet access at the University	29	8.0	127	34.9	72	19.8	103	28.3	33	9.1
5	Office procedures at the ICTs directorate are well-organized and productive.	18	4.9	164	45.1	84	23.1	78	21.4	20	5.5
Overall mean (SD)		3.06(.532)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Regarding the matter addressed in item 1, succinctly encapsulated within the confines of Table 4.14, a prominent observation emerges: a substantial 66.4% of the respondents who took part in the survey indicated their concurrence with the proposition that the university provides accessibility to computer technology equipment encompassing both hardware and software. In contrast, a comparatively smaller yet notable 12.6% of participants expressed disagreement with this notion. Evidently, these findings underline a prevailing sentiment among the sampled individuals, signifying a dominant viewpoint that the university does indeed offer substantial access to computer technology resources, as perceived by the majority of the respondents.

Turning attention to the subject outlined in item 2, as succinctly portrayed within the confines of Table 4.14, a noteworthy insight takes center stage: a substantial 63.2% of the participants who took part in the survey indicated their alignment with the notion that the university is actively offering contemporary and up-to-date technologies. In contrast, a relatively smaller yet discernible 16.5% of respondents expressed a contrary sentiment, signifying disagreement with this perspective. Clearly evident from these findings is a prevailing sentiment among the sampled cohort, underscoring a predominant viewpoint that the university is indeed proactively providing access to modern and advanced technologies, as perceived by the majority of the respondents.

Conforming to the subject elaborated in item 3, as succinctly outlined through the data presented in Table 4.14, a striking pattern emerges: a substantial 71.2% of the individuals who participated as respondents in the survey expressed their dissent regarding the assertion that the university possesses an ample networking infrastructure. In contrast, a considerably smaller yet noticeable 9.3% of participants voiced their concurrence with this perspective. Evidently, these findings underscore a prevailing sentiment among the surveyed cohort, indicating a predominant viewpoint that the university's networking infrastructure is perceived to be inadequate by the majority of those sampled.

Corresponding to the theme elucidated in item 4, as succinctly depicted within the framework of Table 4.14, a salient insight becomes apparent: a notable 42.9% of the participants included in the survey conveyed their disagreement with the proposition that internet access is readily available at the university. In contrast, a substantively close yet distinguishable 37.4% of respondents signified their agreement with this notion. These findings unmistakably highlight a prevailing perspective among the sampled individuals, indicating a prevailing sentiment that a majority of the respondents indeed perceive a lack of sufficient internet access within the university premises.

Regarding the matter expounded in item 5, as succinctly portrayed within the confines of Table 4.14, a significant observation emerges: an impactful 50% of the surveyed participants expressed their disagreement with the notion that the structure of the ICTs directorate office is characterized by efficiency and effectiveness. In contrast, a notable yet comparatively smaller 26.9% of respondents indicated their agreement with this perspective. Clearly evident from these findings is a balanced sentiment among the sampled individuals, indicating a prevailing

viewpoint that the perceived efficiency and effectiveness of the ICTs directorate office structure is contested, with an equal proportion of respondents aligning and opposing this notion.

As derived from the findings presented within Table 4.14, the comprehensive average score attributed to ICT Infrastructure is calculated at 3.06, accompanied by a standard deviation of 0.532. This statistical depiction signifies a mean value surpassing the threshold of 2.6, a benchmark indicative of a disposition towards neutrality in accordance with the evaluation criteria devised by Al-Sayaad et al. (2006) for interpreting mean score ranges within the context of five-point Likert scale inquiries. Consequently, the inferences drawn from the responses of the sampled respondents within the study area suggest a prevailing sentiment that the ICT Infrastructure is perceived as inadequate, given the mean value surpassing the neutral range.

Table 4.15: *Perception of Respondents on Training*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-services installation is well understood.	10	2.7	118	32.4	122	33.5	100	27.5	14	3.8
2	There is training about E-services implementation	23	6.3	119	32.7	107	29.4	94	25.8	21	5.8
3	Awareness programs about E-Services implementation are provided	100	27.5	186	51.1	60	16.5	12	3.3	6	1.6
4	There are constant updates to the way E-services are implemented.	7	1.9	53	14.6	98	26.9	157	43.1	49	13.5
5	Every once in a while, training is done to develop ICTs abilities and competences.	10	2.7	75	20.6	103	28.3	162	44.5	14	3.8
6	To help get E-services up and running, workshops are being planned.	8	2.2	104	28.6	115	31.6	122	33.5	15	4.1

Overall mean (SD)	2.96(.482)

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Aligned with the context presented in item 1, as concisely depicted in Table 4.15, a significant insight emerges: a notable 35.1% of the respondents included in the survey expressed their disagreement with the proposition that a solid comprehension of the E-services implementation concept is prevalent. In contrast, a closely proportioned 31.3% of respondents indicated their agreement with this notion. These findings prominently indicate a prevailing sentiment among the surveyed participants, signaling a prevailing viewpoint that a majority of respondents perceive a lack of comprehensive understanding regarding the concept of E-services implementation.

Addressing the subject detailed in item 2, as succinctly summarized within the confines of Table 4.15, a prominent observation emerges: a notable 39% of the participants who engaged in the survey conveyed their disagreement with the assertion that sufficient training concerning E-services implementation is provided. In contrast, a closely aligned 31.6% of respondents signaled their agreement with this perspective. Evidently, these findings underscore a prevailing sentiment among the surveyed individuals, underscoring a predominant viewpoint that a larger proportion of respondents perceive a lack of adequate training in the context of E-services implementation.

Focusing on the theme expounded in item 3, as succinctly captured within the framework of Table 4.15, a notable insight comes to the fore: an overwhelming 78.6% of the respondents who participated in the survey conveyed their disagreement regarding the assertion that sufficient awareness programs concerning the necessity of implementing E-Services for stakeholders are

made available. In contrast, a notably meager 4.9% of respondents voiced their concurrence with this notion. These outcomes clearly underline a predominant sentiment among the sampled participants, accentuating the perspective that the provision of awareness initiatives addressing the significance of E-Services implementation for stakeholders is perceived to be lacking by the majority of respondents.

Considering the content outlined in item 4, succinctly encapsulated within the delineations of Table 4.15, a compelling insight emerges: a substantial 56.6% of the participants involved in the survey indicated their alignment with the notion that the implementation of E-services is exhibiting continuous improvement over time. In contrast, a relatively smaller 16.5% of respondents expressed disagreement with this perspective. These findings evidently highlight a prevailing sentiment among the sampled individuals, signifying a dominant viewpoint that the majority perceives a trend of ongoing enhancement in the implementation of E-services over the passage of time.

Respecting the topic detailed in item 5, as succinctly encapsulated within the confines of Table 4.15, a notable observation surfaces: a significant 48.3% of the respondents who participated in the survey conveyed their agreement with the notion that ICT skills and competencies are systematically enhanced through training initiatives over time. In contrast, a relatively smaller yet distinct 23.3% of respondents expressed disagreement with this perspective. Evidently, these findings underscore a prevailing sentiment among the surveyed participants, underscoring a predominant viewpoint that a larger proportion of respondents perceive a pattern of skill and competency improvement in the realm of ICT through regular training efforts.

Directing attention to the matter elaborated in item 6, as succinctly illustrated in Table 4.15, a notable insight emerges: a significant 37.6% of the participants who took part in the survey indicated their agreement with the notion that workshops are strategically organized to facilitate the implementation of E-services. In contrast, a closely aligned 30.8% of respondents expressed disagreement with this perspective. As indicated, a majority of respondents believe that workshops can help streamline the implementation of e-services.

Derived from the data elucidated in Table 4.15, the comprehensive average score attributed to training stands at 2.96, accompanied by a standard deviation of 0.482. This statistical representation accentuates a mean value surpassing the threshold of 2.6, a benchmark associated with a neutral standpoint in line with the assessment criteria outlined by Al-Sayaad et al. (2006) for interpreting mean score ranges within the context of five-point Likert scale inquiries. Consequently, the conclusions drawn from the responses of the sampled respondents within the study region indicate a prevailing sentiment that the University is perceived to be limited in its provision of training resources, considering the mean value exceeding the neutral range.

Table 4.16: *Perception of Respondents on Employee Commitment*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	Staff members are enthusiastic and cooperative in using E-Services.	80	22.0	162	44.5	64	17.6	50	13.7	8	2.2
2	Staff members are putting in long hours in order to ensure that E-Services accomplish its goals.	84	23.1	150	41.2	79	21.7	40	11.0	11	3.0
3	There is evidence of pride in the workplace among the staff.	15	4.1	147	40.4	98	26.9	84	23.1	20	5.5

4	Employees have positive towards E-Services	94	25.8	139	38.2	36	9.9	55	15.1	40	11.0
5	The university employees have a cooperative behavior for stakeholders	34	9.3	158	43.4	75	20.6	84	23.1	13	3.6
Overall mean (SD)		2.52(.626)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Regarding the topic outlined in item 1, as succinctly captured within the context of Table 4.16, a notable observation emerges: a significant 66.5% of the respondents who participated in the survey conveyed their disagreement with the assertion that employees are enthusiastic and compliant when it comes to the implementation of E-Services. In contrast, a comparably smaller yet noteworthy 15.9% of respondents indicated their agreement with this perspective. These findings clearly emphasize a prevailing sentiment among the surveyed individuals, underscoring a predominant viewpoint that the majority perceives a lack of employee willingness and adherence to E-Services implementations.

Addressing the subject elaborated in item 2, as concisely depicted within the framework of Table 4.16, a compelling observation emerges: a significant 64.3% of the participants who engaged in the survey conveyed their disagreement with the proposition that employees are exerting significant effort to achieve the predetermined targets within the scope of E-Services implementation. In contrast, a relatively smaller yet notable 14% of respondents signaled their agreement with this perspective. Evidently, these findings underscore a prevailing sentiment among the sampled individuals, signifying a dominant viewpoint that a larger proportion of respondents perceive a lack of substantial exertion by employees in achieving the outlined targets within the context of E-Services implementation.

Regarding the topic discussed in item 3, as succinctly summarized within the confines of Table 4.16, a notable insight emerges: a substantial 44.5% of the respondents who took part in the survey expressed their disagreement with the assertion that employees within the organization display a discernible sense of ownership toward the process of E-Services implementation. In contrast, a notably higher yet discernible 28.6% of respondents indicated their agreement with this perspective. Evidently, these findings underscore a prevailing sentiment among the surveyed individuals, indicating a predominant viewpoint that a larger proportion of respondents perceive a lack of significant ownership exhibited by employees towards the endeavor of E-Services implementation within the organization.

Conforming to the context presented in item 4, as succinctly depicted in Table 4.16, a prominent insight takes center stage: a notable 64% of the participants subjected to the survey conveyed their disagreement regarding the notion that employees exhibit favorable inclinations in their utilization and execution of E-Services, ultimately leading to the accomplishment of its designated targets. In contrast, a comparably smaller yet distinct 26.1% of respondents voiced their agreement with this perspective. Evidently, these findings highlight a prevailing sentiment among the sampled respondents, signifying a dominant viewpoint that a larger proportion perceives that employees generally lack positive tendencies in both the usage and successful implementation of E-Services in order to achieve the outlined objectives.

Regarding the matter expounded in item 5, as succinctly portrayed within the confines of Table 4.16, a salient observation emerges: a significant 52.7% of the respondents who participated in the survey conveyed their disagreement with the proposition that university employees exhibit a cooperative demeanor towards stakeholders. In contrast, a comparably smaller yet notable 26.7% of respondents expressed their agreement with this perspective. Evidently, these findings

underscore a prevailing sentiment among the surveyed individuals, underscoring a predominant viewpoint that a larger proportion of respondents perceive that university employees, as a whole, lack a cooperative behavior towards stakeholders.

Derived from the insights presented in Table 4.16, the comprehensive average score attributed to employee commitment stands at 2.52, accompanied by a standard deviation of 0.626. This statistical portrayal indicates a mean value that falls below the threshold of 2.6, a benchmark indicative of a disposition towards disagreement, as per the evaluation criteria outlined by Al-Sayaad et al. (2006) for interpreting mean score ranges within the context of five-point Likert scale inquiries. Consequently, the conclusions drawn from the responses of the sampled respondents within the study region suggest a prevailing sentiment that employee commitment is perceived to be unsatisfactory, given the mean value residing below the neutral range.

4.5.2. The Relationship between Study Variables

Correlation analysis, as emphasized by Kothari (2012), is a widely employed method to gauge the extent of association between two variables. Its values ranging from -1 to 1 offer a measure of the strength and direction of this relationship. This analytical technique proves invaluable, especially in initial investigations of relationships, serving as a foundational step for researchers. By using correlation analysis, researchers can grasp the presence or absence of connections between variables and, more importantly, identify their direction and potency. This provides a robust starting point, facilitating subsequent refined inquiries. In preparation for regression analysis, it's common practice to conduct a comprehensive examination of independent variables individually through correlation analysis. This aids in understanding how each variable is uniquely related to the dependent variable. To evaluate the strength and nature of these

correlations, researchers often refer to a predefined set of guidelines, serving as a rule of thumb for interpreting variable relationships.

Table 4.17:*Rule of Thumb for about the Strength of Correlation of Coefficient*

Range of Coefficient	Description of Strength
±.81 to ±1.00	Very strong
±.61 to ± .80	Strong
±.41 to ±.60	Moderate
±.21 to ±.40	Weak
±.00 to ±.20	None

Source: Bhattacherjee (2012)

The spectrum of correlation coefficients, along with their corresponding descriptions of strength, has been outlined in Table 4.17. This guide was employed to interpret the relationships between pairs of variables. Consequently, the correlations between the dependent variable, namely E-service implementation, and the independent variables were assessed and documented in Table 4.18. This process facilitated a comprehensive understanding of how the dependent variable correlates with each independent variable individually.

Table 4.18*: Correlation Analysis Result*

Variables		**E-service implementation**
E-service usage capacity	Correlation	.489**
	Sig.	.000
Top managerial commitment	Correlation	.650**
	Sig.	.000
ICT Infrastructure	Correlation	.511**
	Sig.	.000
Training	Correlation	.564**
	Sig.	.000
Employee commitment	Correlation	.541**

	Sig.	.000

Note: **. Correlation is significant at the 0.01 level

Source: Model output, 2021

The outcomes depicted in Table 4.18 reveal noteworthy patterns: firstly, the student's E-service usage capacity displays a positive and statistically significant correlation with E-service implementation ($r = 0.489$, $p < 0.001$). Likewise, top managerial commitment exhibits a positive and statistically significant connection with E-service implementation ($r = 0.650$, $p < 0.001$). Similarly, ICT Infrastructure showcases a positive and statistically significant relationship with E-service implementation ($r = 0.511$, $p < 0.001$). In a similar vein, training manifests a positive and statistically significant correlation with E-service implementation ($r = 0.564$, $p < 0.001$). Similarly, employee commitment demonstrates a positive and statistically significant association with E-service implementation ($r = 0.541$, $p < 0.001$). In summary, all the independent variables present a positive and significant linkage with the dependent variable (E-service implementation).

4.5.3. The Effect of Independent Variables on the Dependent Variable

Indeed, the utilization of a multiple linear regression model to determine E-service implementation is a sound approach. Regression analysis is a robust statistical method aimed at unveiling the variables that exert influence on a particular phenomenon. By employing regression analysis, researchers can confidently discern the pivotal factors, disregard insignificant ones, and comprehend how these variables interplay. This analytical method empowers organizations to grasp the significance of their data points and utilize them effectively through advanced business analytical techniques, thereby enhancing decision-making processes. In this context, the researcher judiciously employed multiple linear regression analysis to unravel

the factors that impact E-service implementation. The model employed E-service implementation as the dependent variable, while student's E-service usage capacity, ICT infrastructure, top managerial commitment, employee commitment, and training were considered as independent variables. This approach enables a comprehensive exploration of the intricate relationships and influences at play, ultimately enhancing the understanding of the factors driving E-service implementation.

Table 4.19: *Results of Multiple Linear Regression Analysis*

E-service implementation	**Coef.**	**St.Err.**	**t-value**	**p-value**	**[95% Conf. Interval]**		**Sig**
E-service usage capacity	.221	.018	12.26	0.000	.185	.256	***
Top managerial commitment	.217	.018	12.17	0.000	.182	.252	***
ICT Infrastructure	.131	.017	7.69	0.000	.098	.165	***
Training	.261	.018	14.56	0.000	.226	.296	***
Employee commitment	.153	.014	10.86	0.000	.125	.181	***
Constant	.084	.075	1.11	0.267	-.064	.231	

Number of obs	364.000
F-test	297.452
Prob > F	0.000

R-squared	0.806

Note*: *** p<.01, ** p<.05, * p<.1*

Source: Model output, 2021

The outcomes detailed in Table 4.19 provide a comprehensive overview of the results derived from the multiple linear regression analysis, which aimed to elucidate the impact of independent variables on E-service implementation. Furthermore, to ensure the avoidance of potential Multicollinearity issues, assessments were conducted to examine heteroscedasticity and violations of normality. Consequently, the model was constructed to encompass all the hypothesized explanatory variables, guaranteeing a comprehensive and inclusive approach to investigating the intricate relationships and influences at play within the framework of E-service implementation. This methodological rigor underscores the reliability and robustness of the study's findings, ensuring that the analysis effectively captures and elucidates the complex dynamics governing the impact of various factors on E-service implementation.

The regression analysis outcomes revealed several important aspects. The computed F-statistic, with a value of 297.5, demonstrated statistical significance at the one percent level. This substantiates the appropriateness and efficacy of the regression model in accurately determining E-service implementation. The R^2 value, which stands at 0.806, signifies that approximately 80.6% of the variance present in E-service implementation has been effectively elucidated by the combination of top managerial commitment, Student’s E-service usage capacity, ICT infrastructure, employee commitment, andtraining. However, it's important to note that around 19.4% of the variability in E-service implementation remains unaccounted for by the selected independent variables encompassed within the model. This insight underscores the comprehensiveness of the model's explanatory power, while also acknowledging that there are

additional factors that contribute to the unexplained variance within the context of E-service implementation.

According to regression output, out of five variables included in the model, all predictors have been significant factors that affect the E-service implementation. Therefore, the following paragraphs describe these variables with their estimation of the results and their implications.

The outcomes outlined in Table 4.19 furnish valuable insights into the relationship between student's E-service usage capacity and E-service implementation. As indicated by the positive and statistically significant coefficient ($\beta = 0.2$, $p < 0.001$), it becomes evident that the competence of students in utilizing E-services significantly influences the successful implementation of such services. This relationship can be further understood from the perspective of the regression coefficient, which implies that, on average, for every one-unit increase in student's E-service usage capacity, a corresponding increase of approximately 0.22 units in E-service implementation is observed. These findings are corroborated by the broader literature, as exemplified by Mambo's (2015) assertion that the successful implementation of electronic services is inherently linked to customers' usage capacity. It is established that customers' knowledge and familiarity with e-service technology play a pivotal role in facilitating smooth implementation. Consequently, when students possess a robust understanding of and proficiency in using E-services, they can navigate and utilize these services effectively, consequently contributing to the overall success of the implementation process. This underscores the importance of investing in enhancing students' digital skills and familiarity with E-services, as it directly impacts the effectiveness of implementing electronic service delivery.

The insights gleaned from Table 4.19 underscore the considerable impact of top managerial commitment on E-service implementation. As evidenced by the positive and statistically significant coefficient ($\beta = 0.2$, $p < 0.001$), it is evident that the commitment demonstrated by top management has a direct and meaningful influence on the successful implementation of E-services. This relationship is further elucidated by the interpretation of the regression coefficient, suggesting that, on average, an increase of one unit in top managerial commitment corresponds to a growth of approximately 0.2 units in the value of E-service implementation. These findings align with broader perspectives in the literature, as exemplified by Worku's (2016) assertion that the success of electronic service implementation is intimately linked to the level of top managerial commitment. This is rooted in the understanding that top management possesses the capacity to make strategic decisions that significantly impact the effectiveness of program implementation. Their commitment drives decision-making processes that can influence the successful execution of initiatives, particularly electronic service delivery. Consequently, when there is strong and demonstrable top managerial commitment, it enhances the overall climate for electronic service implementation, positively impacting its effectiveness and success. This underscores the strategic importance of cultivating a culture of commitment and engagement among top management to bolster the outcomes of E-service implementation initiatives.

The insights emanating from Table 4.19 clearly underscore the substantial influence of ICT infrastructure on E-service implementation. As exemplified by the positive and statistically significant coefficient ($\beta = 0.13$, $p < 0.001$), the availability and quality of ICT infrastructure exert a meaningful impact on the effectiveness of implementing E-services. This notion is further elucidated through the interpretation of the regression coefficient, indicating that, on average, a one-unit increase in ICT infrastructure corresponds to a growth of approximately 0.131 units in

E-service implementation. These findings align with the broader discourse in the literature, as evident in the studies by Quinta and Sirajul (2013) as well as Nabafu and Maiga (2012), which highlight the pivotal role of robust ICT infrastructure in e-government implementation. The availability and reliability of technological resources form the foundation for successful electronic service initiatives. Furthermore, Gossa's (2015) perspective on electronic service implementation resonates, emphasizing that technical and institutional challenges can significantly impede implementation success. When ICT infrastructure faces deficiencies such as system failures, power interruptions, and network issues, these challenges directly impact the smooth execution of E-services. Thus, investing in and ensuring the availability of a strong ICT infrastructure is crucial to overcoming these obstacles and facilitating the successful implementation of electronic services.

The findings depicted in Table 4.19 unequivocally highlight the crucial role of training in influencing E-service implementation. This assertion is substantiated by the positive and statistically significant coefficient ($\beta = 0.3$, $p < 0.001$), which underscores the undeniable impact of well-structured training initiatives on the effectiveness of implementing E-services. The interpretation of the regression coefficient further elucidates this relationship, indicating that, on average, an increase of one unit in training corresponds to a growth of approximately 0.26 units in E-service implementation. These conclusions harmonize with perspectives in the wider scholarly discourse, exemplified by Al-Rashidi's (2010) study which accentuates the significance of training as an internal factor impacting E-Service implementation, especially in developing countries. The role of training is pivotal as it cultivates knowledge, skills, and attitudes among individuals, equipping them to perform tasks effectively. By systematically altering attitudes, knowledge, or skill behavior through learning, training serves as a transformative process.

Moreover, training empowers individuals with the competencies required to seamlessly engage with electronic services. As a result, when employees and service users are properly trained, they are better equipped to navigate and utilize electronic services adeptly, ultimately enhancing the overall success of E-service implementation initiatives.

The findings depicted in Table 4.19 resoundingly affirm the pivotal role of employee commitment in shaping E-service implementation. This assertion is substantiated by the positive and statistically significant coefficient ($\beta = 0.15$, $p < 0.001$), underscoring the profound influence of employees' dedication on the efficacy of implementing E-services. The interpretation of the regression coefficient provides additional clarity, revealing that, on average, an increase of one unit in employee commitment corresponds to a growth of approximately 0.15 units in E-service implementation. These insights align seamlessly with the broader discourse within the academic realm. As exemplified by Endalew's (2017) work, employee commitment emerges as a paramount factor significantly impacting the entire process of electronic service delivery implementation in developing countries. The consistency and quality of employee services are notably bolstered through a combination of emotional and continuous commitment, both of which reflect psychological states. When employees are devoted to their organization and are genuinely committed due to intrinsic motivations, this commitment translates into a consistent dedication to service delivery. Consequently, the commitment exhibited by employees plays a crucial role in fostering a conducive environment for the effective implementation of E-services, ultimately contributing to its success.

4.6. Prospects of E-service Implementation

In this section, a comprehensive analysis is provided concerning the prospects of E-service implementation based on the insights derived from the gathered data. The assessment primarily

revolves around two key aspects: the respondents' perception of the potential for E-service implementation to enhance knowledge and innovation, as well as the potential for E-service implementation to elevate service quality. The consequential outcomes of this analysis are succinctly outlined and expounded upon within the confines of Tables 4.20 and 4.21. These tables serve as a crucial tool for presenting and conveying the significant findings derived from the data evaluation process. By exploring these tables, one gains valuable insights into the respondents' perspectives on the future potential of E-service implementation in fostering knowledge, innovation, and service quality improvements.

Table 4.20: *Prospects of E-service Implementation to Improve Knowledge and Innovation*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-service implementation can possess a great potential for education	12	3.3	13	3.4	48	13.2	72	19.8	219	60.2
2	E-service implementation encourages students to learn	12	3.3	24	6.6	37	10.2	133	36.5	158	43.4
3	E-service implementation improves knowledge by providing different alternatives	11	3.0	4	1.1	46	12.6	134	36.8	169	46.4
4	E-service implementation has a future innovative prediction	12	3.3	24	6.6	25	6.9	132	36.3	171	47.0
5	With all the challenges, e-services have the power to satisfy the need of the academic community	6	1.6	8	2.2	85	23.4	121	33.2	144	39.6
	Overall mean (SD)	4.17(.918)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

In alignment with item 1, as outlined in Table 4.20, a substantial 80% of the sampled respondents expressed agreement with the notion that E-service implementation holds significant potential for enhancing education. Conversely, a mere 6.7% of the respondents disagreed with this perspective. The consequential implication gleaned from this outcome is that the majority of

the sampled respondents shares a positive viewpoint on E-service implementation's substantial capacity to positively impact and enhance the realm of education.

Reflecting on item 2, as elucidated by the findings presented in Table 4.20, a notable 79.9% of the sampled respondents indicated their agreement with the assertion that E-service implementation acts as a catalyst for encouraging students' learning. In contrast, a minor 9.9% of respondents expressed disagreement with this notion. The crux of this outcome points toward the predominant consensus among the sampled respondents that E-service implementation indeed plays a pivotal role in motivating students to engage actively in the learning process.

Exploring item 3, as encapsulated in Table 4.20, it becomes evident that a significant 83.2% of the sampled respondents voiced their agreement with the notion that E-service implementation yields improvements in knowledge dissemination through the provision of diverse alternatives. In contrast, a minimal 9.9% of the respondents expressed disagreement with this perspective. The prevailing implication drawn from these findings underscores the overwhelming consensus among the sampled respondents regarding the role of E-service implementation in enhancing knowledge by furnishing a range of viable alternatives for learning and information access.

In line with item 4, as succinctly displayed in Table 4.20, an overwhelming 83.3% of the sampled respondents concurred with the assertion that E-service implementation within the university context holds the promise of innovative advancements in the future. Conversely, a mere 9.9% of respondents held a contrary viewpoint by expressing disagreement. The consequential inference drawn from these findings is that a significant majority of the sampled respondents harbor an optimistic perspective on the future trajectory of E-service implementation within the university, believing it to be aligned with innovative predictions.

Examining item 5, as succinctly depicted in Table 4.20, a noteworthy 72.8% of the sampled respondents expressed their agreement with the assertion that despite the existing challenges, E-services wield the capability to adequately address the needs of the academic community. Conversely, only a marginal 3.8% of respondents expressed dissenting views. The analysis suggests that most respondents believe that e-services can effectively meet the needs of the academic community, despite the challenges.

In accordance with the details provided in Table 4.20, the comprehensive average value for knowledge and innovation stands at 4.17, accompanied by a standard deviation of 0.918. This statistical insight conveys that the mean value surpasses the threshold of 3.4, as stipulated within Al-Sayaad et al.'s (2006) proposed method for interpreting five-point Likert scale questions. Consequently, this numerical revelation indicates that the respondents within the study area hold a collective perception that universities have significantly contributed to the advancement of knowledge and innovation. The elevation of the mean value beyond the established threshold suggests a prevalent agreement among the respondents regarding the positive role of universities in fostering knowledge and innovation within the academic milieu.

Table 4.21: *Prospects of E-service Implementation to Improve Service Quality*

No.	Statements	SDA		DA		N		A		SA	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
1	E-service implementation account to improve service efficiency	12	3.3	25	6.9	36	9.9	134	36.8	157	43.1
2	E-service implementation can improve service effectiveness	12	3.3	37	10.2	36	9.9	133	36.5	146	40.1
3	E-service implementation can enhance service accountability	12	3.3	12	3.3	49	13.5	182	50.0	109	29.9
4	E-service implementation can enhance service transparency	8	2.2	8	2.2	58	15.9	132	36.3	158	43.4
5	E-service implementation can improve access to information	12	3.3	12	3.3	61	16.8	48	13.2	231	63.5
Overall mean (SD)		4.11(.936)									

Note: SDA= Strongly disagree, DA= Disagree, N= Neutral, A= Agree, SA= Strongly agree

Source: Own survey data, 2021

Regarding item 1, the insights unveiled in Table 4.21 shed light on the perspective of the sampled respondents. Specifically, a significant 79.9% of the participants conveyed their agreement with the notion that E-service implementation holds the potential to enhance service efficiency. In contrast, a modest 10.2% of respondents expressed disagreement with this sentiment. The consequential implication stemming from this outcome is that the majority of the sampled respondents share a positive viewpoint on the role of E-service implementation in

positively impacting service efficiency, thereby underscoring its transformative potential in this aspect.

Turning to item 2, the findings expounded in Table 4.21 cast light on the collective perspective of the sampled respondents. A substantial 76.6% of the participants affirmed their agreement with the notion that E-service implementation has the capacity to enhance service effectiveness. In contrast, a modest 13.3% of respondents expressed dissenting viewpoints. The underlying inference drawn from these findings underscores the predominant consensus among the sampled respondents, indicating their affirmative belief in the potential of E-service implementation to positively impact service effectiveness. This consensus underscores the transformative power attributed to E-service implementation in terms of elevating the overall effectiveness of services provided.

Regarding item 3, the insights encapsulated within Table 4.21 provide a comprehensive understanding of the sentiments held by the sampled respondents. Notably, a substantial 79.9% of the participants conveyed their agreement with the perspective that E-service implementation holds the potential to bolster service accountability. Conversely, a mere 6.6% of respondents expressed disagreement with this sentiment. The consequential implication drawn from this outcome underscores the prevailing consensus among the sampled respondents, underscoring their collective belief in the transformative capacity of E-service implementation to enhance service accountability.

Turning to item 4, as elucidated by the findings presented in Table 4.21, a significant 79.7% of the sampled respondents expressed their agreement with the assertion that E-service implementation has the potential to augment service transparency. In contrast, a mere 4.4% of

respondents held dissenting views. The consequential inference drawn from these findings is that the majority of the sampled respondents share a positive viewpoint on E-service implementation's capacity to positively impact service transparency. This prevailing consensus underscores the transformative potential of E-service implementation in terms of promoting transparency within the realm of services provided.

Examining item 5, as outlined in Table 4.21, it becomes apparent that a significant 76.7% of the sampled respondents voiced their agreement with the perspective that E-service implementation holds the potential to enhance access to information. Conversely, a minor 6.6% of respondents expressed a contrasting viewpoint through disagreement. The consequential inference drawn from these findings underscores the prevailing consensus among the sampled respondents that E-service implementation can indeed play a pivotal role in improving access to information.

In alignment with the insights gleaned from Table 4.21, it becomes evident that the comprehensive average value for service quality stands at 4.11, accompanied by a standard deviation of 0.936. This statistical revelation signifies that the mean value surpasses the established threshold of 3.4, as stipulated by Al-Sayaad et al.'s (2006) recommended technique for interpreting five-point Likert scale questions. Consequently, the collective perception of the sampled respondents within the study area distinctly indicates that universities are perceived to make substantial contributions in elevating service quality. The fact that the mean value exceeds the specified threshold underscores the prevailing consensus among the respondents regarding the favorable impact of universities on service quality improvement.

The qualitative findings gleaned from the study shed light on the multifaceted prospects of E-service implementation within higher education institutions in Ethiopia, unveiling a tapestry of

potential advantages. These encompass amplified accessibility to educational resources, fostering an environment where students, particularly those in remote or underserved regions, can seamlessly access essential learning materials. Additionally, the transformative impact of E-service implementation emerges through the augmentation of teaching and learning experiences. Digital tools such as e-learning platforms, digital libraries, and online assessment tools hold the promise of redefining the pedagogical landscape, offering interactive and engaging platforms that cater to the evolving preferences of modern learners. The insights from key informants echo the sentiment that E-service implementation could act as a catalyst for improved administrative efficiency, increased collaboration, and global competitiveness. This comprehensive perspective underscores the potential for E-service implementation to revolutionize the higher education landscape, ushering in enhanced educational access, efficiency, and innovation.

The implementation of electronic services holds the potential to revolutionize administrative operations within higher education institutions. Streamlining tasks like registration, fee payment, and course scheduling through electronic platforms can significantly alleviate administrative burdens, fostering a more efficient and effective service delivery. Moreover, the integration of electronic tools, such as online discussion forums and collaborative workspaces, can catalyze collaborative efforts and knowledge exchange among both students and faculty members. This dynamic interaction cultivates an environment where ideas, experiences, and best practices are freely shared, enriching the overall learning experience. Beyond the confines of campus, the implementation of electronic services can augment the global competitiveness of Ethiopian higher institutions. By providing access to cutting-edge educational technologies and fostering the adoption of best practices, these institutions can position themselves as attractive destinations for international students and faculty.

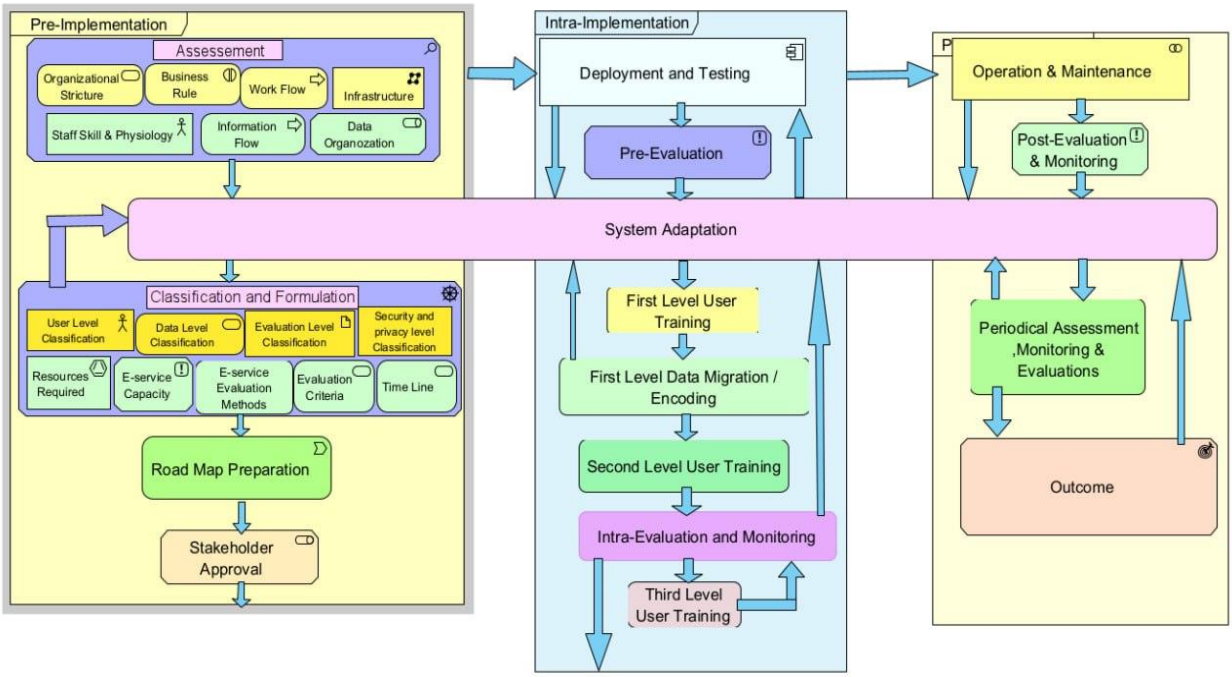
4.7. E-service Implementation Framework

The overarching objective of this section is to construct a comprehensive and process-oriented framework tailored for the successful implementation of e-services within higher learning institutions in Ethiopia. This framework is meticulously shaped by a meticulous examination of prevailing theories and practical approaches, aiming to provide valuable insights for future endeavors in this domain. While there exist certain frameworks designed for e-government implementation within developing nations, an illustrative example being one derived from critical success factors (CSFs) and aligned with the Diffusion of Innovation (DOI) Theory, as exemplified by the work of Apleni and Smuts (2020), the researcher has identified certain limitations within these frameworks. Specifically, the identified framework is primarily attuned to informing the progression of innovation decisions, and it is observed to exhibit a degree of generality that might not optimally guide the practical aspects of e-services implementation. As a response to these limitations, the current study aspires to contribute by crafting a more nuanced and application-centric framework that aligns the theoretical underpinnings with the intricate realities of e-services implementation, ensuring a robust and effective roadmap for future implementations in higher learning institutions of Ethiopia.

Taking the student survey result as input about the existing e-services challenges in higher learning institutions as well as learning from process frameworks from implementation research (Damschroder, 2020), the researcher designed an e-service implementation process with three phases: pre-implementation, intra-implementation and post-implementation. The Framework is shown in Figure 4.1 . The design was incrementally improved through a feedback-system that involved key-informant interview (university higher officials and ICT Directors) and a seminar presentation. In addition, the researcher’s experience as owner and senior strategic management

and executive roles of a private university collage is used to sharpen the framework to the current maturity level.

Figure 4.1*:* Implementation framework for e-service in higher learning institutions of Ethiopia



4.7.1. Pre-Implementation

1. **Assessment**

Assessment of Organization Structure

Before implementing e-services in a higher institution, it is essential to assess the organization's structure. This involves understanding the hierarchy, departments, and reporting relationships within the organization. The assessment helps determine how the software will be integrated into the existing structure and how different stakeholders will interact with the system.

- **Hierarchy**: The hierarchy of an organization refers to the different levels of authority and responsibility within the organization. This information is important to understand when

implementing e-services because it will help to determine who will have access to the system and what permissions they will have.

- **Departments**: The departments within an organization are responsible for different functions or areas of work. This information is important to understand when implementing e-services because it will help to determine how the system will be used by different departments.
- **Reporting relationships**: The reporting relationships within an organization define who reports to whom. This information is important to understand when implementing e-services because it will help to determine how the system will be used to track and manage information.

By assessing the organization's structure, the institution can identify any gaps that need to be addressed before implementing e-services. This will help to ensure that the e-services are implemented successfully and that the system is used effectively by different stakeholders. Here are some specific steps that can be taken to assess the organization's structure:

- Conduct interviews with key stakeholders to understand their roles and responsibilities.
- Review organizational charts and policies and procedures.
- Observe the organization in action to see how it functions.

By taking these steps, the institution can gain a deep understanding of its structure and how e-services can be implemented to improve its operations.

Assessment of Business Rules

Business rules are the policies, regulations, and guidelines that govern various processes within an organization. They define how things should be done and what decisions should be made. In a

higher education institution, business rules may include admission criteria, grading systems, course registration procedures, and more.

When implementing e-services in a higher education institution, it is crucial to assess the existing business rules. This is to ensure that the e-service implementation aligns with the institution's policies and requirements. Any necessary modifications to the software or business rules can then be identified and implemented.

Here are some specific steps that can be taken to assess the existing business rules:

- Identify business rules by reviewing policies and procedures, interviewing stakeholders, and observing processes.
- Document the business rules in a clear and concise manner. This will make it easier to understand the rules and to identify any gaps or inconsistencies.
- Analyze the business rules to see if they are aligned with the institution's goals and objectives. If the rules are not aligned, then they may need to be modified or replaced.
- Identify any necessary modifications to the software or business rules. This may involve changing the way the software works or the way the rules are enforced.

By taking these steps, the institution can ensure that the e-service implementation is aligned with its business rules and that the system is used effectively.

Here are some additional benefits of assessing business rules before implementing e-services:

- It can help to identify potential risks and problems before they occur.
- It can help to ensure that the e-service implementation is cost-effective.
- It can help to ensure that the e-service implementation is efficient and effective.
- It can help to improve compliance with regulations.
- It can help to improve customer satisfaction.

Assessment of Business Workflow:

The business workflow is the sequence of activities and interactions between different stakeholders in managing e-service information flow. It includes processes such as application submission, document verification, fee payment, and communication with applicants. Assessing the business workflow is important for e-service implementation because it can help identify bottlenecks and inefficiencies, which can then be streamlined and automated.

- Identify the different stakeholders involved in the e-service process. This includes students, faculty, staff, and administrators.
- Map out the sequence of activities and interactions between the stakeholders. This can be done by using a flowchart.
- Identify any bottlenecks or inefficiencies in the process. This can be done by looking for tasks that are duplicated, tasks that are taking too long, or tasks that are not necessary.

By taking these steps, the institution can identify any bottlenecks or inefficiencies in the e-service process and make it more efficient and effective.

Assessment of Network Infrastructure

To implement e-services in a higher institution, it is important to assess the organization's network infrastructure. This assessment should examine the availability, reliability, and security of the network to ensure that the e-services can be seamlessly integrated and accessed by authorized personnel from different locations.

- Availability: The network must be available 24/7 to support the e-services. This means that the network must be able to withstand disruptions such as power outages and hardware failures.

- Reliability: The network must be reliable and able to handle the load of the e-services. This means that the network must have enough bandwidth and capacity to support the number of users and the amount of data that will be transferred.
- Security: The network must be secure to protect the data that is being transferred. This means that the network must have firewalls and intrusion detection systems to prevent unauthorized access.

By evaluating the organization's network infrastructure, the institution can identify any gaps that need to be addressed before implementing e-services. This will help to ensure that the e-services are implemented successfully and that the data is protected.

Here are some specific steps that can be taken to evaluate the network infrastructure:

- Conduct a network audit to identify any vulnerability.
- Test the network's performance under load.
- Monitor the network for security threats.
- Implement security measures to protect the network.

Assessment of Staff Skills

The success of implementing e-services depends on the staff who will be using and managing them. It is important to assess their technical skills, familiarity with digital services, and willingness to learn new things in the pre-implementation stage. If necessary, training programs or workshops can be organized to ensure that the staffs is well-prepared to use the e-services effectively.

Technical skills: The staff members who will be using the e-services need to have the necessary technical skills to operate them. This includes knowledge of the user interface, as well as the ability to troubleshoot problems.

- Familiarity with digital services: The staff members should also be familiar with the concept of digital services and how they work. This includes understanding the benefits of using digital services, as well as the challenges that can be encountered.

- Willingness to learn new things: The staff members need to be willing to learn new things and embrace change. This is important because digital services are constantly evolving, and the staff needs to be able to adapt to new changes.

By assessing the staff's skills, familiarity, and willingness to learn new things, the organization can ensure that the e-service implementation is successful. If necessary, training programs or workshops can be organized to help the staff develop the necessary skills and knowledge.

Assessment of Information Flow

The assessment of information flow involves analyzing how data and information move within an institution. This includes identifying the sources of data, how it is collected, stored, and shared. Understanding the information flow helps ensure that the E-service implementation allows for seamless integration with existing data sources, eliminates redundancy, and facilitates efficient data exchange across different departments and stakeholders.

Here are some specific steps that can be taken to assess the information flow:

- Identify the different sources of data within the organization. This includes internal data sources, such as databases and files, as well as external data sources, such as social media and government websites.

- Analyze how data is collected from each source. This includes understanding the different methods that are used to collect data, such as manual entry, surveys, and sensors.
- Determine how data is stored within the organization. This includes understanding the different databases and files that are used to store data, as well as the security measures that are in place to protect data.
- Identify how data is shared within the institution. This includes understanding the different ways that data is shared, such as through reports, dashboards, and APIs.

By taking these steps, the institution can identify any gaps or inefficiencies in the information flow. This information can then be used to improve the information flow, making it more efficient and effective.

Assessment of Data Organization:

The data organization assessment is an important aspect of the software implementation framework for e-services. It involves analyzing the structure, format, and integrity of the existing data related to e-services. This ensures that the software can effectively handle different data types, maintain data consistency, and provide accurate reporting and analytics capabilities. It is also used to prepare the data migration techniques during software implementation.

Here are some specific steps that can be taken to assess data organization:

- Identify the different data types that are used to store e-service data. This includes text, numbers, dates, and images.
- Analyze the format of the data. This includes understanding how the data is structured and how it is coded.

- Determine the integrity of the data. This includes checking for errors and inconsistencies in the data.
- Suggest ways to improve the data organization. This may involve changing the way the data is structured, coded, or stored.

Prepare the data migration techniques. This includes identifying the data that needs to be migrated, the format of the data, and the tools that will be used to migrate the data. By taking these steps, the organization can identify any gaps or inefficiencies in the data organization. This information can then be used to improve the data organization, making it more efficient and effective. It can also help to prepare the data migration techniques, which will be necessary to move the data from the old system to the new system.

2. System Adaptation

System adaptation or modification in e-service implementation refers to the process of making changes to an existing electronic service based on the assessment results. An assessment is conducted to evaluate the effectiveness, efficiency, and usability of the e-service. The purpose of this assessment is to identify areas that need improvement or changes to better serve the users.

Once the assessment is complete, the findings are analyzed to determine the necessary modifications or adaptations required. These modifications can encompass various aspects of the e-service, such as its functionality, user interface, security measures, or performance.

The process of system adaptation typically involves the following steps:

1. Identification of Assessment Results: The assessment report is carefully reviewed to identify the specific areas that require modification. This includes identifying user pain points, system limitations, or any other issues identified during the evaluation.

2. Prioritization of Modifications: Based on the severity and impact of identified issues, modifications are prioritized. High-priority modifications addressing critical issues or user needs are given immediate attention.
3. Requirement Analysis: The identified modifications are further analyzed to determine the specific requirements to be implemented. This includes defining the desired changes, specifying the new features, or clarifying the enhancements needed.
4. Design and Development: Once the requirements are finalized, the design and development of the modifications begin. The development team works on incorporating the changes into the existing system while ensuring it aligns with the overall architecture and functionality.
5. Testing and Quality Assurance: The modified system goes through rigorous testing to ensure the changes do not introduce new issues and align with the desired outcomes. Robust quality assurance processes are put in place to verify that the modified system functions accurately and reliably.
6. Implementation and Rollout: Once the modifications are thoroughly tested and approved, they are implemented in the live environment. This process may involve updating software, configuring servers, or deploying new hardware components depending on the nature of the modifications.
7. User Training and Support: If significant changes are introduced, it is crucial to provide adequate training and support to users. This ensures a seamless transition and helps users adapt to the modified system effectively.
8. Ongoing Monitoring and Evaluation: After the modifications are implemented, continuous monitoring and evaluation are essential. This helps identify any unforeseen issues, gather user feedback, and make further improvements if needed.

In summary, system adaptation or modification in e-service implementation is a carefully planned process that aims to improve the functionality, usability, and performance of an electronic service based on assessment results. It involves identifying areas for improvement, analyzing requirements, designing and developing modifications, testing, implementation, and ongoing monitoring.

3. Classification and Formulation

The third stage of the pre-implementation stage in the e-service implementation framework is Classification. In this stage, the e-service provider should identify different classifications such as:

- **Software user level classification**: This classification identifies the different types of users who will be accessing the e-service. For example, there may be different levels of access for administrators, staff, and customers.
- **Data level classification**: This classification identifies the different types of data that will be stored and processed by the e-service. For example, there may be different levels of sensitivity for personal information, financial information, and intellectual property.
- **Evaluation level classification**: This classification identifies the different types of evaluation that will be conducted on the e-service. For example, there may be functional testing, security testing, and usability testing.
- **Security and privacy level classification**: This classification identifies the different security and privacy measures that will be implemented for the e-service. For example, there may be measures to protect against unauthorized access, data loss, and data breaches.

The purpose of this stage is to identify and document the different classifications that will be used for the e-service. This information will be used in the subsequent stages of the implementation framework to ensure that the e-service is designed, developed, and implemented in a secure and privacy-preserving manner.

Here is a more detailed explanation of each of the classifications:

- **Software user level classification**: This classification identifies the different types of users who will be accessing the e-service. For example, there may be different levels of access for administrators, staff, and customers. Administrators will typically have the highest level of access, allowing them to manage the e-service and its users. Staff may have a lower level of access, allowing them to perform specific tasks within the e-service. Customers may have the lowest level of access, allowing them to view and use the e-service's features.

- **Data level classification**: This classification identifies the different types of data that will be stored and processed by the e-service. For example, there may be different levels of sensitivity for personal information, financial information, and intellectual property. Personal information is any information that can be used to identify an individual, such as their name, address, and social security number. Financial information is any information about an individual's finances, such as their bank account numbers and credit card numbers. Intellectual property is any creative work, such as a book, song, or invention. The data level classification will determine how the data is stored, processed, and protected. For example, personal information may be encrypted and stored in a secure location. Financial information may be stored in a database with restricted access. Intellectual property may be watermarked to prevent unauthorized copying.
- **Evaluation level classification**: This classification identifies the different types of evaluation that will be conducted on the e-service. For example, there may be functional testing, security

testing, and usability testing. Functional testing ensures that the e-service meets its requirements and works as expected. Security testing ensures that the e-service is protected against unauthorized access, data loss, and data breaches. Usability testing ensures that the e-service is easy to use and understand.

- Security and privacy level classification: This classification identifies the different security and privacy measures that will be implemented for the e-service. For example, there may be measures to protect against unauthorized access, data loss, and data breaches. Unauthorized access can be prevented by using passwords, firewalls, and intrusion detection systems. Data loss can be prevented by backing up the data regularly and using encryption. Data breaches can be prevented by implementing security policies and procedures, such as training employees on security best practices.

4.7.2. Intra-Implementation

The goal of the intra-implementation stage is to facilitate a seamless transition to the new e-service system, ensuring that users are well-prepared, data is migrated correctly, and any necessary modifications are implemented. By following these steps, higher education institutions can increase the chances of a successful implementation and maximize the potential benefits of the new system.

Let's delve into each step in more detail:

1. **Deployment and Testing**

In this step, the e-service system is installed, and thorough testing is performed to ensure its proper functioning. It is essential to validate that the modifications made during the pre-implementation stage have been successfully integrated into the system. In the deployment and

testing phase of the intra-implementation stage, the focus is on installing the e-service system and testing its functionality. Here is a more detailed explanation:

Installation*:* The first step is to install the e-service system on the designated servers or cloud infrastructure. This process involves setting up the necessary hardware, software, and network configurations to support the system's operation. The installation may require collaboration with IT specialists or system administrators to ensure a smooth deployment.

Configuration*:*Once the e-service system is installed, it needs to be configured to align with the specific requirements of the higher education institution. This step includes setting up user permissions, defining access levels, establishing communication protocols, and customizing the system based on institutional needs. The modifications made during the pre-implementation stage should be integrated into the system during this configuration process.

Integration Testing: After the initial configuration, rigorous testing is performed to ensure that the e-service system is functioning correctly and is compatible with the modifications made during the pre-implementation stage. Integration testing involves verifying that all elements of the system work harmoniously together, including user interfaces, databases, external integrations, and any customizations.

Functionality Testing: This phase focuses on testing the various functions and features of the e-service system to ensure they perform as intended. Different scenarios and use cases are executed to validate the system's behavior and identify any potential flaws, bugs, or performance issues. Functionality testing covers a wide range of aspects, such as user authentication, data input and retrieval, communication features, transaction processing, and error handling.

Stress and Load Testing: It is essential to assess how the e-service system performs under heavy workloads and high user traffic. Stress and load testing simulate peak usage scenarios to evaluate the system's scalability, responsiveness, and stability. This testing ensures that the system can handle a large number of concurrent users and maintain optimal performance without experiencing slowdowns or crashes.

Security Testing: The security of the e-service system is of paramount importance, especially in a higher education setting where sensitive data is often involved. Security testing is conducted to identify vulnerabilities, validate access controls, detect potential breaches, and ensure compliance with data protection regulations. This may involve penetration testing, vulnerability scanning, encryption assessment, and evaluation of authentication and authorization mechanisms.

Usability Testing: Usability testing aims to ensure that the e-service system is user-friendly, intuitive, and meets the needs of its intended users. Testers or representatives from

2. Pre-implementation evaluation:

This step focuses on identifying any potential problems or limitations in the e-service before it is rolled out to users. Surveys, interviews, or focus groups can be conducted to gather feedback and assess the system's readiness for full deployment. Pre-implementation evaluation is a crucial step in the development and deployment of an e-service system. It involves assessing the system's readiness and identifying any potential problems or limitations before it is made available to users. The goal is to ensure that the system is fully functional, user-friendly, and meets the needs and expectations of its intended users. To conduct a pre-implementation evaluation, various methods can be employed, such as surveys,

interviews, or focus groups. These methods allow for gathering feedback from potential users, stakeholders, or experts who can provide valuable insights and perspectives on the e-service.

Surveys can be used to collect quantitative data and opinions from a large number of participants. They can include questions about the system's usability, functionality, and overall satisfaction. Surveys can be distributed online or in person, depending on the target audience.

Interviews provide an opportunity for in-depth discussions with selected individuals or groups. They allow for a more detailed exploration of specific issues or concerns related to the e-service. Interviews can be conducted face-to-face, over the phone, or through video conferencing.

Focus groups involve bringing together a small group of individuals who represent the target user base. They engage in guided discussions facilitated by a moderator to gather collective opinions, ideas, and suggestions. Focus groups can provide valuable insights into user preferences, expectations, and potential challenges.

The feedback and data collected through these methods are then analyzed to identify any potential problems or limitations in the e-service system. This evaluation helps in making necessary adjustments, improvements, or refinements to ensure that the system is ready for full deployment. By conducting a pre-implementation evaluation, organizations can proactively address any issues or concerns, minimize risks, and enhance the overall user experience. It allows for a smoother transition from development to deployment, increasing the chances of successful adoption and usage of the e-service.

3. **System adaptation or modification:**

Based on the feedback received during the pre-implementation evaluation, adjustments may be necessary to address any identified problems. This could involve making modifications to the system or refining certain processes to enhance functionality.

4. **First-level user training:**

During this stage, the initial group of users, typically referred to as the first wave, undergoes comprehensive training. This training encompasses all aspects of the e-service system, ensuring that users have a strong foundation in using it effectively.

5. **First-level data migration:**

Migrating data from the old system to the new e-service system is a critical step. Careful planning and execution are required to ensure a smooth transition and to prevent any data loss or inconsistencies.

6. **Second-level user training:**

Once the first group of users is trained and comfortable with the system, the next wave of users undergoes training. The training for this group may be slightly less comprehensive than the first level but should still cover all necessary aspects.

An integral facet of this stage involves the delivery of advanced training to the second tier of users, encompassing staff and students who are regular beneficiaries of the e-services. This training transcends the foundational aspects covered in the earlier training phase, delving into

more intricate and advanced topics. Participants gain expertise in harnessing the e-services to generate content, foster collaboration, and extract maximum value from the system's capabilities.

7. **Intra-evaluation and monitoring:**

Continuous evaluation and monitoring of the new system are crucial to ensure that it meets user needs and is being utilized effectively. Regular assessments help identify any issues or areas for improvement, enabling timely adjustments.

8. **Third-level user training:**

This step pertains to the comprehensive training of the third level of users, comprising those responsible for overseeing the administration and management of the e-services. This training endeavors to impart proficiency in configuring the system, adeptly troubleshooting challenges, managing user accounts, and ensuring the seamless operation of the entire e-service architecture.

It involves training new users who join the organization and require proficiency in the e-service system. These individuals are trained on the system or process to ensure a smooth onboarding experience.

4.7.3. Post implementation stage

The post-implementation phase marks the subsequent chapter after the successful execution of the e-service framework, focusing on the sustained enhancement, optimization, and continued utilization of the implemented system. This phase comprises a series of pivotal steps that collectively contribute to the refinement and seamless operation of the e-service ecosystem:

1. Operation and Maintenance

Operations & Maintenance involves planning for, and executing, activities, such as operating production software applications, monitoring system performance, making defect repairs, testing the application after any changes are made, and tuning a releases software system.

Overview

Modern software solutions are highly intricate pieces of technology that require regular updates and maintenance.

• It is a common notion that software costs are a one-time expense that is incurred when the software is being developed/purchased. This is not the case.

• Industry experts estimate that over 90% of all costs related to a relatively modern piece of software are the regular maintenance costs that are often not accounted for.

OBJECTIVE/GOALS

Objective

Successful completion of the Operations and Maintenance Phase should comprise:

- Management of changes to the system to support end users

Monitoring of system performance

- Performance of required security activities such as backups, contingency planning, and audits
- Continuation of end user support through training and documentation.

Goals

The purpose of the Operations and Maintenance Phase is to ensure the information system is fully functional and performs optimally until the system reaches its end of life.

2. **Post-Evaluation and Monitoring**

Integral to this phase is the ongoing process of meticulous evaluation and continuous monitoring. Regular assessment and observation provide insights into the system's performance and effectiveness, serving as a dynamic mechanism to identify potential areas for enhancement. By continually refining the e-service implementation plan based on real-world observations and user feedback, the institution ensures that the system remains aligned with evolving needs and consistently delivers value.

In essence, the post-implementation stage embodies the institution's commitment to perpetual improvement and optimization. It underscores the iterative nature of technological integration, where responsiveness to user dynamics and a proactive stance towards evolving challenges come together to forge a sustainable and impactful e-service ecosystem.

3. **Periodical Assessment Monitoring & Evaluations**

The purpose of the Periodic Assessment is to ensure that the computer system remains compliant with regulation, is fit for its intended use and satisfies HLE policies and procedures.

It should also fit with the HLE Operation Excellence / Continuous Improvement program.

When to Perform a Periodic Review

The frequency of performing Periodic Reviews should be dependent on the Complexity, Criticality, Novelty and Operating History of the e-service. Once the operating history has been established and the system is stable (minimal incidents and changes) then the frequency can be reduced.

The frequency of review should be defined with a minimum and maximum time between reviews, for example a scale of 1 to 4 years can be set for the review period. Only new Systems would have an annual review period. This would be extended as discussed above as the operating history demonstrated that the system operation is stable.

Non configurable systems starting with a frequency of 2 years when first installed through to a maximum 4 years once a stable operating history is established.

The periodic review of computer systems can be a considerable overhead for regulated companies. The decision and rationale must be documented.

It is the responsibility of the Software Company to set the periodic review schedule and document the rationale and approach within a Standard Operating Procedure.

Description of the periodical Assessment & Monitoring

Inputs to the review process include:

- Design Documents (Specifications, Risk Assessments, etc)
- Incident Log / Fault Sheets and Maintenance
- Deviations
- Change Controls

The start of the review should identify whether there have been any regulatory or HLE policy changes since last review. If identified then a gap analysis should be performed on the system and associated documentation against the change. Where gaps are identified then a decision should be made as to whether corrective action is required.

Trends should be identified for systems faults. Have a number of deviations and / or incidents been attributed to the computer system? Where trends are identified the root cause analysis should identified and an action plan put in place.

Standard Operating Procedures for the Operation, Maintenance and Security Management should be reviewed along with the design documentation. These documents should be current and up to date. They should be reviewed against changes to ensure that there has been no impact. In addition audit trails / security access logs should be reviewed to ensure that the systems are controlled in secure fashion.

Performing the Review

There are two methods which can be followed for establishing and maintaining the validated state of a computer system. The first is the traditional periodic review of the computer system which is performed at a predefined period. The second is continual monitoring and trending with a review report.

Equipment History or Validation Equipment Files can be used to provide continual monitoring of Incidents Logs, Deviations and Changes. By logging these either to paper or electronically can be used to trend. The continual monitoring can be used to make improvements before minor incidents become quality related deviations.

All actions and recommendations resulting from the E-Service Periodic Review should be logged in the HLE system.

Consideration should be given to the number and extent of the changes and the impact of cumulative effect of the changes. Often verification is centered on the individual change. Reviewing the changes as a group can determine whether the overall design intent has been impacted.

Where risk assessments have been performed during the design and implementation of the system, the assumptions made at the time of the assessment (particularly frequency of occurrence).

A report should be produced detailing the validation / compliance status of the system.

Benefits of E-Service Periodical Assessment Monitoring & Evaluation

Monitoring and trending incidents and deviations relating to E-Service in real time provides greatest benefit to E-Service Quality. Identify trends and taking corrective action can improve the operation of E-Service and maintain compliance.

Performing a periodic review at a defined frequency can be time consuming, trawling change control, deviation and incident databases and then analyzing and reporting the results. This also does not support the continuous improvement, identifying issues early and making improvements.

A hybrid of the two approached can be used to ensure the most efficient approach to ensuring on going compliance. The most critical, complex or bespoke E-Service have continuous monitoring process, as detailed above. Less complex systems that do not change routinely and are stable a periodic review may be the better solution to demonstrating maintaining compliance.

CHAPTER 5: SUMMARYAND CONCLUSSION

5.1. Introduction

This pivotal chapter serves as the culmination of the research endeavor, meticulously summarizing the study's major findings, distilling them from the amalgamation of quantitative and qualitative data analyses. It unfolds like a roadmap for the reader, commencing with a succinct overview of the research's core discoveries, which act as signposts guiding us through the subsequent sections. As we venture deeper into this chapter, the findings come to life, intricacies and interconnections unravel, and the data's richness is unveiled through detailed quantitative analyses and qualitative insights, lending depth and context to the research outcomes. The chapter's crescendo arrives in the form of profound conclusions, not merely reiterations of facts, but thoughtful reflections on their implications, bridging the gap between data and real-world significance. Finally, it leaves us with a torch to carry forward the recommendations, carefully tailored to address the research's identified gaps and thus providing a foundation upon which future inquiries, policies, and practices can be built, ensuring the enduring impact of this study in the academic and practical realms alike.

5.2. Summary of Major Findings

The primary aim of this study was to construct a comprehensive framework for the effective implementation of e-services within higher education institutions in Ethiopia. To achieve this objective, a robust dataset was generated from the input of 364 respondents who diligently completed the research questionnaire. Subsequently, the collected data underwent a thorough analysis, employing a diverse set of statistical techniques, including frequency, percentage,

mean, standard deviation, correlation, and multiple linear regression. This multifaceted analytical approach allowed for a comprehensive exploration of the research data. Drawing upon the insights gleaned from both the statistical results and the qualitative responses provided by the participants, several key summaries and findings have emerged, which are detailed below. These summaries encapsulate the crucial outcomes and implications of the research, serving as a valuable synthesis of the study's core contributions to the field of e-service implementation in Ethiopian higher education.

- The socio-demographic profile of the respondents provides valuable insights into the composition of the study's participants. Notably, a substantial majority, comprising 65.7% of the sampled respondents, were male, reflecting a gender distribution within the study. Furthermore, the age distribution revealed that the largest proportion, accounting for 48.9%, fell within the 35-44 age category, highlighting a significant presence of mid-aged individuals among the respondents. In terms of academic status, a noteworthy majority of 58.2% were in their second year of study, indicating a focus on students who have progressed beyond their initial academic year. Moreover, the enrollment pattern indicated that 48.4% of the respondents were enrolled in regular programs, suggesting a significant representation of students pursuing standard academic tracks. Lastly, the academic stream distribution showed that a substantial 63.2% of the sampled students were enrolled in social science disciplines, underscoring the prevalence of this field among the study's participants. These socio-demographic insights provide a contextual backdrop for understanding the respondent pool and can be instrumental in interpreting the study's findings and their potential implications.

- The study meticulously gauged students' attitudes towards the implementation of electronic services through a structured assessment employing Likert-type questions. The composite findings unearthed notable insights into the perceptions of the sampled respondents within the study area. First and foremost, the data revealed that students perceived the ease of use of electronic services to fall below their anticipated expectations, as evidenced by a mean score of 2.5 and a standard deviation of 0.664. This suggests that students may have encountered challenges or experienced a less intuitive interface when engaging with electronic services, highlighting the imperative need for enhancements in usability and user-friendliness. Furthermore, the assessment uncovered that the overall average perception of students regarding the content and appearance of information was insufficient, registering a mean score of 2.97 and a standard deviation of 0.533. This finding underscores the significance of refining the quality and visual presentation of information within electronic services to align them more closely with students' desired standards. Additionally, the data indicated that the overall average evaluation of functionality and the interaction environment, with a mean score of 3.10 and a standard deviation of 0.494, fell short of students' anticipated levels. This implies that there is room for improvement in the functionality and interaction elements of electronic services to create a more robust and engaging environment for students. In sum, these findings collectively emphasize the pressing need for enhancements in ease of use, content and appearance, and functionality and interaction within electronic services to better align them with students' expectations, ultimately fostering more effective and satisfying experiences in higher learning institutions.

- The assessment of electronic service implementation within higher educational institutions in Ethiopia was conducted by gauging the perspectives of students in terms of five critical dimensions: web presence, interaction, transaction, transformation, and networked presence/full integrated presence. The collective evaluation of students' perceptions revealed that there is a commendable level of web presence, with a mean score of 3.59 and a standard deviation of 0.396, indicating positive feedback in this aspect. However, the findings also unveiled areas of concern, as the overall average values for transaction (Mean=2.99, SD=0.676), interaction (Mean=2.64, SD=0.634), transformation (Mean=1.95, SD=0.540), and networked presence (Mean=1.94, SD=0.564) fell short of satisfaction. These results suggest that while the institutions have made progress in establishing a solid web presence, there is a notable need for improvement in the areas of transactional services, interactive platforms, transformative educational experiences, and networked presence to enhance the overall electronic service delivery for students.

- The descriptive summary of the study variables paints a clear picture of the perceptions held by the sampled respondents in the study area regarding various crucial factors. Firstly, the overall average value of E-service usage capacity (Mean=2.75, SD=0.477) underscores the prevailing sentiment that the respondents believed their capacity for utilizing E-services was insufficient, indicating a need for enhancement in this aspect. Secondly, the overall average value of top management commitment (Mean=2.51, SD=0.529) reflects the respondents' belief that the level of commitment from top managers did not meet their expectations, suggesting a potential gap in leadership engagement. Thirdly, the total average value of ICT Infrastructure (Mean=3.06,

SD=0.532) indicates that the respondents felt the ICT infrastructure was lacking, highlighting a need for improvements in technological resources. Fourthly, the overall average value of training (Mean=2.96, SD=0.482) signals that the respondents perceived limitations in the training offered by the University, suggesting a potential need for expanded educational opportunities. Finally, the overall average value of employee commitment (Mean=2.52, SD=0.626) reveals that the respondents viewed employee commitment as unsatisfactory, potentially indicating a call for increased engagement and motivation among staff members. These findings collectively underscore areas of concern and improvement in the context of E-service usage and support within the study area.

- The correlation analysis conducted to assess the individual relationships between the study variables has revealed significant insights. Firstly, there is a positive and statistically significant association between students' E-service usage capacity and E-service implementation ($r = 0.489$, $p<0.001$), indicating that as students perceive their capacity to use E-services more favorably, there is a corresponding positive impact on the implementation of these services. Secondly, the positive and statistically significant relationship between top managerial commitment and E-service implementation ($r = 0.650$, $p<0.001$) underscores the vital role of leadership in driving effective E-service implementation. A higher level of top managerial commitment is associated with a more successful E-service implementation. Thirdly, the positive and statistically significant relationship between ICT Infrastructure and E-service implementation ($r = 0.511$, $p<0.001$) highlights the importance of robust technological infrastructure in supporting and enhancing E-service delivery. Similarly, the positive and statistically significant

relationship between training and E-service implementation ($r = 0.564$, $p<0.001$) emphasizes the role of training programs in preparing individuals to effectively utilize and contribute to the implementation of E-services. Finally, the positive and statistically significant relationship between employee commitment and E-service implementation ($r = 0.541$, $p<0.001$) indicates that a higher level of employee commitment is associated with more successful E-service implementation, underlining the significance of motivated and engaged staff in the process. These correlation findings collectively underscore the interdependence of these factors in shaping the successful implementation of E-services within the study context and provide valuable insights for further improvements and strategic interventions.

- A multiple linear regression analysis was employed to discern the factors influencing E-service implementation within higher institutions of Ethiopia. Critical diagnostic assessments, including checks for multicollinearity, heteroscedasticity, and normality, were conducted to ensure the reliability of the regression model. The results of the F-statistic ($F=297.5$, $p<0.001$) underscore the appropriateness of the regression model for evaluating E-service implementation. Furthermore, the R2 value of 0.8 signifies that approximately 80.6% of the variability in E-service implementation can be accounted for by the combined influence of Student's E-service usage capacity, top managerial commitment, ICT infrastructure, training, and employee commitment. Nevertheless, the remaining 19.4% of the variance in E-service implementation remains unexplained by the selected independent variables within the model, suggesting the presence of other unexamined factors or potential areas for further investigation in understanding the dynamics of E-service implementation in higher education institutions in Ethiopia.

- The findings from the regression analysis have revealed the primary influential factors for electronic service implementation within higher education institutions in Ethiopia. Notably, student's E-service usage capacity ($\beta = 0.2$, $p < 0.001$) emerged as a significant factor, suggesting that as students' capacity to utilize E-services increases, it positively impacts the implementation of electronic services. Similarly, top managerial commitment ($\beta = 0.2$, $p < 0.001$) plays a crucial role, signifying that a higher level of commitment from top management is associated with more successful E-service implementation. Additionally, the presence of robust ICT infrastructure ($\beta = 0.13$, $p < 0.001$) is essential, indicating that a well-developed technological foundation is conducive to effective electronic service implementation. Training programs ($\beta = 0.3$, $p < 0.001$) also emerged as a significant factor, underlining the importance of providing adequate training to individuals to enhance E-service implementation. Lastly, employee commitment ($\beta = 0.15$, $p < 0.001$) was identified as another key influencer, emphasizing that motivated and engaged staff members contribute positively to the implementation of electronic services. These insights offer valuable guidance for higher education institutions in Ethiopia seeking to improve their E-service implementation strategies.

- The comprehensive evaluation of knowledge and innovation (Mean = 4.17, SD = 0.918) indicates that the sampled respondents in the study area perceive that the university makes a substantial contribution to enhancing knowledge and fostering innovation. This conclusion is reinforced by the fact that the mean value exceeds the threshold of 3.4, which is indicative of an agreement level according to Al-Sayaad et al.'s (2006) proposed techniques for mean score ranges on a five-point Likert scale. Similarly, the overall assessment of service quality (Mean = 4.11, SD = 0.936) underscores that the

respondents believe electronic service implementation can significantly elevate the quality of services offered by higher educational institutions. These findings collectively suggest a positive outlook on the university's role in promoting knowledge, innovation, and service quality through electronic service implementation, emphasizing the potential benefits it brings to the academic community.

- The researcher's approach to designing an e-service implementation process for higher learning institutions is commendable and reflects a thorough and iterative methodology. Drawing from student survey results and insights from process frameworks, the framework was meticulously crafted into three distinct phases: pre-implementation, intra-implementation, and post-implementation, signifying a holistic and comprehensive approach to the e-service implementation lifecycle.

5.3. Conclusion

The potential benefits of electronic service implementation in educational provision, such as flexible access, increased speed, extended service availability, and enhanced accuracy through technology-assisted teaching, are indeed substantial. However, it is evident that the actual practice of electronic service implementation in higher learning institutions of Ethiopia is currently facing significant challenges. While there is a presence of basic web-based information dissemination, as well as email-based service interactions and student information management systems for academic information handling, the full potential of E-services, particularly in terms of interaction, transaction, transformation, and seamless integration, remains largely untapped. The implementation progress in these areas is notably sluggish and seems to be in its infancy. Addressing these limitations and accelerating the development of a more comprehensive and

functional E-service ecosystem within higher education institutions could significantly enhance the quality and accessibility of education in Ethiopia.

The factors that exert a significant influence on electronic service implementation in higher institutions of Ethiopia have been identified as follows: Firstly, students' E-service usage capacity plays a pivotal role, as their knowledge and proficiency in utilizing electronic services directly impact the implementation process. Secondly, the presence of top managerial commitment within higher education institutions is crucial, as it fosters a supportive environment for successful electronic service implementation. Thirdly, the availability of robust ICT infrastructure is essential, as it provides the technological backbone necessary for effective service delivery. Moreover, employee commitment is identified as a key factor, emphasizing the importance of motivated and engaged staff in facilitating the implementation of electronic services. Lastly, internal training programs are recognized as a vital component, ensuring that individuals within the institution are adequately prepared and skilled to contribute to the success of electronic service implementation. These factors emphasizing the need for a well-coordinated interaction of diverse elements to ensure its success.

Electronic service delivery holds significant promise in enhancing knowledge, fostering innovation, and elevating service quality. The implementation of E-services not only has the potential to revolutionize education but also encourages students to engage in learning by offering diverse alternatives and innovative approaches. Moreover, E-service implementation contributes to the continuous improvement of knowledge by providing access to a wealth of information and facilitating innovative predictions for the future. Additionally, E-services can lead to increased service efficiency and effectiveness, as processes become streamlined and optimized. Furthermore, they enhance service accountability and transparency, fostering a sense

of trust and reliability among users. Ultimately, E-service implementation plays a pivotal role in improving access to information, making it more readily available and accessible to a wider audience.

The framework was systematically developed, comprising three distinct phases: pre-implementation, intra-implementation, and post-implementation. This approach reflects a commitment to a well-structured and iterative methodology, emphasizing the importance of considering the entire e-service implementation lifecycle. Such a thoughtful and holistic framework is poised to guide higher learning institutions in Ethiopia towards more effective and successful e-service implementation, ultimately benefiting both students and staff.

5.4. Suggestions

To enhance the practice of electronic service implementation in higher institutions of Ethiopia, the researcher recommends a multifaceted approach. The posible recommendations are lited as follows:

- The current state of electronic service implementation in higher learning institutions in Ethiopia is characterized by weaknesses, with E-service functionality in areas like interaction, transaction, transformation, and full integration still at an early stage and progressing slowly. To address these challenges and improve E-service implementation, a collaborative effort involving various stakeholders is essential. This includes active engagement from the Ministry of Education to provide guidance and support, as well as the university management bodies to set strategic priorities and allocate resources effectively. Employees and students should also be actively involved, with a focus on continuous training and capacity building to enhance their commitment and proficiency

in E-service implementation. By fostering a culture of collaboration and investing in ongoing education and skill development, higher institutions can work towards achieving more robust and effective E-service delivery, ultimately benefiting the entire academic community.

- The impact of students' E-service usage capacity on E-service implementation is evident, underscoring the importance of proactive measures by universities. To enhance this capacity and bolster students' IT competence, it is crucial for institutions to implement comprehensive and ongoing training initiatives, workshops, and educational programs. In addition, involving students from the outset in the E-service delivery process is key, empowering them to actively contribute to and shape the improvement of E-service implementation within universities. By providing students with the necessary skills and involving them as stakeholders, higher institutions can harness their insights and enthusiasm to drive more effective and student-centric E-service solutions.

- The pivotal role of top managerial commitment in influencing E-service implementation cannot be overstated, and it necessitates concerted efforts at both the institutional and governmental levels. The Ministry of Science and Higher Education should prioritize and actively work to enhance top management commitment within higher institutions by providing necessary resources, incentives, and guidance. This can include offering training programs for both staff and students to foster commitment and understanding of the importance of E-service implementation. Moreover, investments in ICT infrastructure should be made to provide the necessary technological foundation for effective E-service delivery. Simultaneously, efforts should be directed toward developing students' E-service usage capacity to ensure their active participation and contribution to E-service

implementation. By focusing on these aspects, the Ministry and institutions can pave the way for successful E-service implementation and the overall advancement of their universities.

- Recognizing the critical importance of ICT infrastructure in E-service implementation, universities should prioritize the adoption of forward-looking ICT policies. This entails strategic planning and investments in both hardware and software IT equipment to establish a supportive and robust ICT infrastructure. Simultaneously, the government plays a pivotal role in ensuring that public universities have access to up-to-date technologies that align with their E-service development strategies. This can be achieved through budget allocations specifically earmarked for ICT infrastructure enhancements and ongoing consultation with relevant stakeholders to identify and address the evolving needs of higher education institutions in the digital age. Collaborative efforts between universities and the government will be instrumental in establishing the necessary ICT foundation for successful E-service implementation and advancement in education and service delivery.

- Employee commitment emerges as a crucial factor in E-service implementation, emphasizing the importance of nurturing and empowering the workforce. To bolster this commitment, universities should prioritize training and motivation for employees involved in E-service initiatives. This can be achieved through the development and distribution of comprehensive manuals, standards, and guidance documents to provide clarity and support for E-service delivery activities. Furthermore, regular staff development programs and continuous training opportunities should be instituted to enhance the skills and capabilities of the staff, keeping them up-to-date with evolving

technologies and best practices. By investing in their employees' growth and providing the necessary resources and support, universities can cultivate a workforce that is not only committed but also well-equipped to drive successful E-service implementation and contribute to the institution's overall success.

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APPENDICES

Appendix A: Survey Questionnaire

PARUL UNIVERSITY

FACULTY OF IT AND COMPUTER SCIENCE

DEPARTMENT OF COMPUTER APPLICATION

Dear respondents,

I am a Ph.D. scholar in the department of information technology, Parul University. Currently, I am undertaking a thesis entitled " **Towards Developing a Framework for Successful Implementation of Electronic Service in Higher Learning Institutions of Ethiopia**" You are one of the respondents selected to participate in this study. Your participation is fully voluntary, and the questionnaire is totally anonymous. I confirm that the information you share will be kept confidential and used only for academic purposes. Thus, please give correct and complete information.

Thank you in advance for your willingness to participate in this study!

General Instructions:

Please indicate your choice by circling an appropriate number of your responses to each question for closed-ended questions and filling the blank spaces for open-ended questions.

PART I: Graduate Students Background Information

1. Gender 1. Male 2. Female

2. Age in years _____

3. Your batch 1.First Year 2. Second Year 3. Third Year

4. Which program are you enrolled in? 1.Regular 2.Weekend 3.Summer 4. Distance

5. What is your stream/field of study?

1.Social Science 2.Natural Science 3.Engineering and Technology

PART II: Attitude of Students towards E-service Implementation

6. The questions listed below were constructed to understand your attitude toward electronic service implementation. Please use the following ***rating scales*** to express your responses: **1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A), and 5= Strongly Agree (SA),** and indicate using a tick (√) under the rating scale numbers to show your level of agreement with the statement.

S/No	Statements	Scale				
		1	2	3	4	5
1	E-services provides me what I need easily as compared to the traditional way of getting services					
2	Every student should start using E-service as it makes routines easier					
3	E-service implementation helps me to save time and energy					
4	When I use E-service, it helps me to access what I want easily.					
5	E-service implementation makes the information clearer to me.					
6	As a student, I can easily get the information from the university website without physically coming to the campus					
7	The presence of E-service implementation can help me get up-to-date information					
8	Students can easily get information at their own pace					
9	I can easily complete administrative and academic activities electronically					

10	E-service facilitate interaction among students					
11	E-learning services platform are entertaining to use					
12	As a student, I can get academic and administrative related services from anywhere as the distance is not a factor					
13	E-learning is an innovative approach and must be encouraged					
14	As a student, I like the idea of all types of e-services					
15	My university e-services platforms are user friendly and easy to use					

PART III: The Practice of E-service Implementation

7. Which types of E-services practiced in the university?

1. Online admission services
2. Providing online students' academic information
3. Online teachers' evaluation
4. Online curriculum report
5. E-learning services
6. Financial services
7. E-library services
8. Others if any (Specify) _____

8. The following statements are used for measuring the levels of electronic services implementation. Thus, please use the following **rating scales** to express your response: **1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A), and 5= Strongly Agree (SA)** and indicate using a tick (√) under the rating scale numbers to show your level of agreement with the statement.

S/No	Statements	Scale				
		1	2	3	4	5
1	The university has an up-to-date functional official website.					
2	The university website allows visitors a downloadable form of different documents of the platform.					
3	The university's programs, calendars, schedules are available on the university website.					
4	There is access to update information and news through the university website.					
5	Students and staff can access their profiles from the university website.					
6	Submission of online applications is possible					
7	Teachers can submit students' academic result online					
8	Students can see their academic result online					
9	There is a two-way online service transaction between the university and its stakeholders.					
10	There is an online response for service requests through the university website.					
11	The low-level hierarchies are linked to the higher-level system with similar functions of E-Services Implementation					
12	There is integration among the E-services across different administrative boundaries.					
13	There is an online dialogue between the university and its stakeholders.					
14	There are online consultation services through the university website.					
15	The university has a well-designed website and other platforms like facebook and youtube accounts in addition to a website for delivering e-services					
16	The e-services platforms facilitate the interaction between students and instructors as well as administrators					

PART IV: Factors that Influence E-service Implementation

9. Please use the following ***rating scales*** to express your response: **1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A), and 5= Strongly Agree (SA),** and indicate using a tick **(√)** under the rating scale numbers to show your level of agreement with the statement.

A. Student's E-service Usage Capacity

S/No	Statements	Scale				
		1	**2**	**3**	**4**	**5**
1	Students are involved in activities of E-Services implementations.					
2	Students are capable of processing information in the E-Services implementation.					
3	Students have technical skills to use E-Services implementation					
4	Students have awareness regarding E-Services implementation					
5	Students can complete the E-Services tasks by themselves					
6	Students do not go to an office for asking the service delivered online					

B. Top Managerial Commitment

S/No	Statements	Scale				
		1	2	3	4	5
1	The university managers give support concerning E-Services implementation.					
2	There is an open two-way communication system between the university managers and the university's stakeholders.					
3	The top management is ensuring control at all levels of the university's organizational hierarchy.					
4	The university's top managers allocate responsibilities.					
5	The leadership style of the university's top management is supportive of E-Services implementation.					
6	The university management established goals, strategies, policies, plans, and baselines to achieve E-Services implementation.					

C. ICT Infrastructure

S/No	Statement	Scale				
		1	2	3	4	5
1	There is access to computer technology equipment (Hardware and software) in the university					
2	The university is providing updated technologies					
3	There is sufficient networking infrastructure in the university					
4	There is internet access at the University					
5	The ICTs directorate office structure is efficient and effective					

D. Training

S/No	Statements	Scale				
		1	2	3	4	5
1	There is a good understanding of the E-services implementation concept.					
2	There is training about E-services implementation.					
3	Awareness programs about the need for implementing E-Services for stakeholders are provided.					
4	The implementation of E-services is getting improved from time to time.					
5	ICTs skills and competencies are improved from time to time by training.					
6	Workshops are prepared to facilitate E-services implementation.					

E. Employee Commitment

S/No	Statements	Scale				
		1	2	3	4	5
1	Employees are willing and adhere to E-Services implementations.					
2	Employees are working hard to meet the targets as planned in the E-Services implementation.					
3	Employees in the organization have shown a sense of ownership to E-Services implementations.					
4	Employees have positive tendencies in the usage and implementation of E-Services and to meet its targets.					
5	The university employees have a cooperative behavior for stakeholders.					

PART V: Prospects of E-service Implementation

10. Please use the following ***rating scales*** to express your response: **1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A), and 5= Strongly Agree (SA),** and indicate using a tick **(√)** under the rating scale numbers to show your level of agreement with the statement.

S/No.	Statements	Scale				
		1	2	3	4	5
1	E-service implementation can possess a great potential for education.					
2	E-service implementation encourages students to learn.					
3	E-service implementation improves knowledge by providing different alternatives.					
4	E-service implementation in the university has a future innovative prediction.					
5	E-service implementation account to improve service efficiency.					
6	E-service implementation can improve service effectiveness.					
7	E-service implementation can enhance service accountability.					
8	E-service implementation can enhance service transparency.					
9	E-service implementation can improve access to information.					
10	With all the challenges, e-services have the power to satisfy the need of the academic community					

Thank you for your cooperation!

Appendix B: Key Informant Interview

PARUL UNIVERSITY

FACULTY OF IT AND COMPUTER SCIENCE

DEPARTMENT OF INFORMATION TECHNOLOGY

Dear key informants,

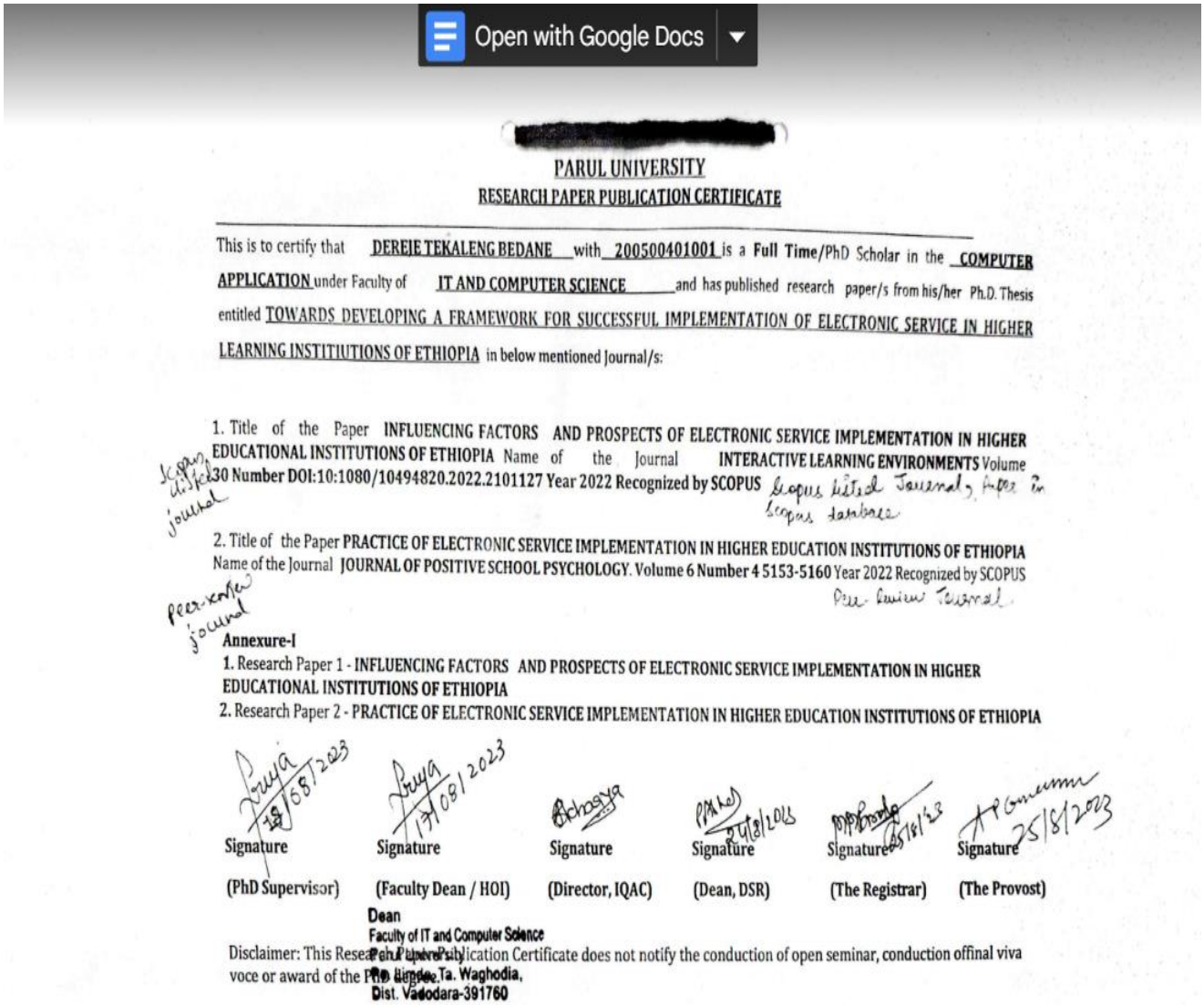
This interview schedule is intended to collect data on **"Towards Developing a Framework for Successful Implementation of Electronic Service in Higher Learning Institutions of Ethiopia"** The researcher now assures you that the information you provide will be reported and communicated in the aggregate and with care. It will remain private and will only be used for academic purposes.

Thank you in advance for your willingness.

1. What are the attitudes of graduate students towards E-service delivery? Explain.
2. What are the most used E-Services implementation in the university? Explain.
3. How do you express the status of E-Services implementation in the university?
4. What are the factors that affect E-Services implementation? How?
5. What are the prospects of E-service implementation? Explain.
6. What do you recommend for the smooth implementation of E-service at the university?

Thank you for your cooperation!

Appendix C: Publication Certificate



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PARUL UNIVERSITY

RESEARCH PAPER PUBLICATION CERTIFICATE

This is to certify that **DEREJE TEKALENG BEDANE** with **200500401001** is a **Full Time**/PhD Scholar in the **COMPUTER APPLICATION** under Faculty of **IT AND COMPUTER SCIENCE** and has published research paper/s from his/her Ph.D. Thesis entitled **TOWARDS DEVELOPING A FRAMEWORK FOR SUCCESSFUL IMPLEMENTATION OF ELECTRONIC SERVICE IN HIGHER LEARNING INSTITUTIONS OF ETHIOPIA** in below mentioned Journal/s:

1. Title of the Paper **INFLUENCING FACTORS AND PROSPECTS OF ELECTRONIC SERVICE IMPLEMENTATION IN HIGHER EDUCATIONAL INSTITUTIONS OF ETHIOPIA** Name of the Journal **INTERACTIVE LEARNING ENVIRONMENTS** Volume **30 Number DOI:10:1080/10494820.2022.2101127 Year 2022 Recognized by SCOPUS** Scopus listed Journal, Paper in Scopus database

2. Title of the Paper **PRACTICE OF ELECTRONIC SERVICE IMPLEMENTATION IN HIGHER EDUCATION INSTITUTIONS OF ETHIOPIA** Name of the Journal **JOURNAL OF POSITIVE SCHOOL PSYCHOLOGY. Volume 6 Number 4 5153-5160** Year 2022 Recognized by SCOPUS Peer-review Journal

Annexure-I

1. Research Paper 1 - **INFLUENCING FACTORS AND PROSPECTS OF ELECTRONIC SERVICE IMPLEMENTATION IN HIGHER EDUCATIONAL INSTITUTIONS OF ETHIOPIA**
2. Research Paper 2 - **PRACTICE OF ELECTRONIC SERVICE IMPLEMENTATION IN HIGHER EDUCATION INSTITUTIONS OF ETHIOPIA**

Signature	Signature	Signature	Signature	Signature	Signature
(PhD Supervisor)	(Faculty Dean / HOI)	(Director, IQAC)	(Dean, DSR)	(The Registrar)	(The Provost)

Dean
Faculty of IT and Computer Science
Parul University
P.O. Limda, Ta. Waghodia,
Dist. Vadodara-391760

Disclaimer: This Research Publication Certificate does not notify the conduction of open seminar, conduction offinal viva voce or award of the PhD degree.

Journal of Positive School Psychology

20-04-2022

Dear Author(s) Dereje Tekaleng, Dr. Priya Swaminarayan

The Title "PRACTICE OF ELECTRONIC SERVICE IMPLEMENTATION IN HIGHER EDUCATION INSTITUTIONS OF ETHIOPIA"

It's our great pleasure to inform you that your above-mentioned manuscript has been reviewed and *accepted* for publication in **Journal of Positive School Psychology** with **ISSN 2717-7564**. This letter of acceptance is considered as an official acceptance of your manuscript with no further amendments required.

Your article will be published in forthcoming Regular Issue.

With warm regards

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Influencing factors and prospects of electronic service implementation in higher educational institutions of Ethiopia

Dereje Tekaleng & Priya Swaminarayan

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A Strategic Framework for Implementing E-Services in Higher Educational Institutions of Ethiopia

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Abstract

Higher education e-services constitute a paradigm change in this age of rapid technology. Modernization and efficiency depend on E-services in Ethiopian colleges. This change demands a strategic framework that balances technical developments with Ethiopia's unique socio-cultural and infrastructural setting. This research presents an Ethiopian-contextualized strategic framework for higher education E-service integration. The framework model for implementing electronic services in higher education institutions was developed using the Design Science research approach (DSR), enhanced by integrating systemic-holistic and socio-technical perspectives, including the soft systems methodology (SSM), and visualized using Visual Paradigm version 17, a prototyping tool, to create an attractive and user-friendly representation. The result shows a comprehensive Ethiopian higher education E-services implementation framework. Before implementation, institutional framework, operational standards, workflow processes, network infrastructure, human capabilities, and information flow are evaluated. Addressing significant issues aligns policy and prepares for future stages improvement-focused implementation research. Electronic service efficiency, performance, and usefulness improve with complete checks. Steps include modification identification, prioritizing, requirement analysis, design and development, rigorous testing, smooth deployment, user training, and continual monitoring and assessment. Completeness guarantees the electronic service satisfies user needs, improving efficiency and satisfaction. After implementation, the software application undergoes operation, system performance monitoring, problem resolution, post-modification testing, and system fine-tuning. This process continues until the system is shut down. Research emphasizes ongoing assessment and monitoring to identify development areas and demonstrate technology integration. Research suggests periodic legal, fitness for purpose, and policy and procedure compliance reviews, monitoring, and evaluations.

Appendix D: Conference Certificate

1st E-International Conference on "Innovative Management Practices : Digital Learning Solutions for sustainable Business Models"
Organized by Faculty of Management Studies
17th October, 2020

Certificate

This is to Certify that

Mr./Mrs./Prof./Dr. DEREJE TEKALENG BEDANE has

Presented / Submitted a paper titled

Challenges, practices and prospects of ICT based education in Ethiopia

in the international Conference held at Parul University, Waghodia, Gujarat, India.

Dr. Bijal Zaveri
Dean - Faculty of Management Studies

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CERTIFICATE

OF PRESENTATION

This is to certify that

Dereje Tekaleng

has /have presented a paper titled **Red Kidney Beans Quality Inspection Using Digital Image Processing Techniques** in the ***International Conference of Emerging Vista's of Computer Science, IT And Management In 21st Century*** organized by Faculty of IT and Computer Science, Parul University in association with Universitas Teknokrat Indonesia on 28th February 2023.

Dr. Priya R. Swaminarayan
Principal-PICA
Director-PIET-MCA,
Dean-Faculty of IT and Computer Science,
Parul University

Dr. Abhishek Mehta
Assistant Professor,
PIET-MCA,
Parul University

Prof. Vipul Gamit
Assistant Professor,
PIET-MCA,
Parul University

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Faculty of IT and Computer Science, Parul University
National Conference
On
Emerging Vistas of Computer Science & IT in 21st Century (NCEVT-2021)
18th December, 2021

Certificate of Presentation

This is to certify that **Dereje Tekaleng , Dr. Priya Swaminarayan** *has /have presented a paper titled* **FACTORS THAT INFLUENCE ELECTRONIC SERVICE IMPLEMENTATION IN HIGHER INSTITUTIONS OF ETHIOPIA** *in the First National Conference on Emerging Vistas of Computer Science & IT in 21st Century on December 18, 2021 Organized by the Faculty of IT and Computer Science, Parul University, Vadodara, Gujarat.*

Dr. Priya R. Swaminarayan
Dean - FITCS
Parul University

Prof. Anjali Mahavar
Assistant Professor – PICA - BCA
Parul University

Norad

University of South-Eastern Norway

CERTIFICATE OF ACHIEVEMENT

This is to certify that

Mr.Dereje Tekalegn

Successfully delivered *seminar on e-service Implementation in Higher Learning Institutions of Ethiopia* organized by *Hawassa University Institute of Technology* and *Infolink University College* from March 24-25, 2023.

Dr.-Ing. Fasika Bete Georgise
Scientific Director with the Rank of Vice President
Hawassa University Institute of Technology

Appendix E: Training Certificate

Parul® University

CERTIFICATE
OF PARTICIPATION

Presented to

Dereje Tekalegn Bedane

For successfully conducting the **"7 days FDP on "RESEARCH METHODOLOGY"** at Faculty of Management Studies, Parul University from **09.06.2022 to 16.06.2022.**

We wish you all the best for future endeavour

Dr. Bijal Zaveri
Director, Parul Institute of Management and Research,
Dean, Faculty of Management Studies,
Parul University.

Norad

University of South-Eastern Norway

CERTIFICATE OF PARTICIPATION

This certificate has been awarded to

Mr.Dereje Tekalegn

For successful completion of a short term training on Grant Proposal Writing and Seminar on e-Service Implementation in Higher Learning Institutions and Cybersecurity organized by *Hawassa University Institute of Technology* and *Infolink University College* from March 24-25, 2023.

Dr. Eng. Fasika Bete Georgise
Inst/of Tech/Scientific Director
With the Rank of Vice President

Dr.-Ing. Fasika Bete Georgise
Scientific Director with the Rank of Vice President
Hawassa University Institute of Technology

Dr. Shegaw Anagaw
Associate Professor of Information Systems
USN Business School, Norway