ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

MATURITY AS A CRITICAL SUSTAINABILITY FACTOR FOR E-GOVERNMENT: TOWARDS A CONCEPTUAL FRAMEWORK

By

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Addis Ababa, Ethiopia

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Declaration

This thesis has not previously been accepted for any degree and is not being concurrently submitted in candidature for any degree in any university.

I declare that this thesis entitled "**Maturity as a Critical Sustainability Factor for E-Government: Towards a Conceptual Framework**" is a result of my investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisor. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

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Hiwot Feleke Mormora

This thesis has been submitted for examination with my approval as a university advisor.

Advisor's Signature: _____

Lemma Lessa (Ph.D.)

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Abstract

Extant literature reveals that many e-government initiatives fail, especially in developing countries. Despite the alarming failure rate of e-government initiatives, the governments of developing countries are allocating a huge budget out of their limited resources to support and improve e-government services.Prior research suggested that maturity is a prerequisite for e-government sustainability, but the relationship between e-government maturity and sustainability has not been investigated. Hence, this research is aimed at developing a conceptual framework that maps e-government maturity to a sustainable e-government service.

Qualitative case study was employed in selected government organizations in Ethiopia that provide e-service through the e-government portal of Ethiopia. The determinants of e-government maturity and sustainability were derived from extant literature and the relationship between them were conceptualized. The conceptual framework was evaluated through document analysis and interview with experts. A six-step qualitative data analysis framework by Kiger and Varpio (2020) has been used to identify, analyze, organize, describe, and report patterns within the collected data.

The study results show that availability of an ICT department with an independent annual budget for the e-government development, human resource capability/ human and intellectual capability, staff retention, manager's commitment to prioritize e-government projects, degree and frequency of customer contacts, customer satisfaction, ICT infrastructure development , integration, Website age, legal and political strategies, institutional instability, organizational e-government operational plan, political environment and e-payments were identified to be the determinants of e-government maturity. These determinants are found as the key factors that affect e-government service maturity. Some of the determinants identified from the literature review were excluded after the case study investigation and some other determinants are newly identified. The study contributes to e-government literature by providing a better understanding on the determinants of e-government service maturity and sustainability. Identifying the determinants of maturity and sustainability and exploring the link between the two constructs improve our understanding of sustainable e-government services. The outcome of the research could also be of value for practitioners as a quality tool to assess the maturity and sustainability of e-government initiatives.

keywords: *Maturity, Sustainability, E-government maturity, E-government sustainability, E-government Success*

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Contents

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List of Acronyms

EDI	Electronic Data Interchange
E-Government	Electronic Government
GTP	Growth Transformation Plan
HRM	Human Resourece Managment
ICT	Information Communication Technology
IS	Information Systems
IT	Information Technology
MDG	Millennium development Goals
MinT	Ministry of Innovation and Technology
MoICT	Ministry of Information and Communication Technology

CHAPTER ONE

INTRODUCTION

This chapter presents the background of the study, motivation behind the study, statement of the problem, and the basic research questions succeeded by objectives both the general objective and the specific objectives of the study. Besides, the significance of the study and the scope of the research are also discussed in this same chapter. At every stage of the discussion, relevant justifications have been briefly made. In addition, the justifications have been supported by related literature from the field. The chapter concludes with a summary of the stud's structure of the remaining part of the paper.

1.1.Background of the Study

Information and communication technology (ICT) is critical to assure efficiency and effectiveness in a variety of domains, including government services, the economy, and social affairs. Currently, its integration is becoming necessary; without it, almost no operations will take place (Lessa, 2019). Government offices are among the most prominent organizations that have been influenced by ICT. The government uses this technology to provide a variety of services. This technology is also used by the government to prepare and transmit data (Okab, 2018). Nowadays, technology has practically made such a significant difference that every government service may be provided electronically. As a result, many developing countries are turning to e-government to improve government service delivery while saving money (Joshi, 2018). As a result of e-government initiatives, the majority of government services are now delivered through websites(Okab, 2018).

E-government initiatives are aimed at enhancing government functioning all around the world. The successful implementation of these measures is likely to result in the improvement of government services (Klischewski & Lessa, 2013).E-government services have a lot of benefits, especially for developing countries such as Ethiopia. In these countries, e-government would facilitate citizens' access to government information and services. It also helps governments overcome various procedural responsibilities. In general, it enhances the performance and

efficiency of government services. Moreover, it increases the effectiveness of the implementation and the pace at which services are delivered (UN E-Government Survey, 2010). On top of these, e-government increases service quality, transparency, accountability, responsiveness, and citizen involvement. It also creates a better interaction between the government and citizens (G2C). While reducing corruption in the government sector, it also creates harmonious social relationships and increases political participation (Lessa et al., 2015). Additionally, time-saving services, electronic exchange of data and documents, provision of government services throughout the week without a break, and conducting electronic financial transfers (Okab, 2018) are among the benefits described in the literature.

Due to the aforementioned advantages and following the success stories of developed countries, many developing countries have implemented e-government initiatives to address a wide range of economic, social, technological, infrastructural, legal, and educational concerns (Sahlu & Kim, 2019). In recent years, the governments of developing countries are allocating a huge budget out of their limited resource to support and improve e-government services. For governments with limited budgets and resources, e-government projects have become more expensive and difficult to complete, requiring more time and money (Joshi, 2018; Lessa, 2019). Similar to the developed countries, developing nations have begun to launch e-government programs as part of their modernization efforts. Despite all their efforts, e-government deployment in developing countries is still deemed insufficient (Mkude & Wimmer, 2013).

Though the growth of e-government in the underdeveloped nations is gradual, governments of these nations have already realized that ICT is a critical instrument for achieving the Millennium Development Goals (MDGs) (Belachew, 2010). Ethiopia has also been working on several socio-economic projects which were proposed during the country's medium-term development plans and during the two most recent Growth Transformation Plans (GTP I & II). The country also plans and provides many social services through various government entities. This, among other things, demands properly obtaining, documenting, and sharing information via e-government between government stakeholders as well as recipients or county citizens at large (MoICT, 2013)

E-government was envisioned and implemented by the previous Ministry of Information Technology (MoICT) to enhance ICT based governance process. As a result, a five-years strategy was developed and implemented from 2011 to 2015. MoICT collaborated with external experts to

establish a framework to support Ethiopia's Action Plan development. A plan for e-government, which was designed based on project focus areas was implemented from 2016 to 2020 and it progressed well over the previous five years. Over a multi-year period, Ethiopia's e-government strategy was planned to deliver 219 e-services involving seventy-seven (77) enlightening and one hundred thirty-four (134) value-based administrations. The plan was intended to execute twelve (12) ventures, with administration services given through four channels (Portal, Call Center, Mobile Devices, and Common Administration Focus). The National Payment Gateway, Enterprise Architecture Structure, Public Key Infrastructure, National Data Set, National Enterprise Service Bus, and National integrated Authentication are among the six (6) key activities that were expected to stimulate and reinforce delivery (MoICT, 2013). Ethiopia's e-government project, which is overseen by the Ministry of Innovation and Technology, is currently one of the most important government strategic plans aimed at boosting ICT-based transparency and accountability. (Habtemariam, 2019).

1.2.Motivation

Despite the critical benefits of e-government services, there are numerous obstacles to their long-term use, including limited budgets, donor reliance, technology transfer, short-term involvement of non-local agents, and a relatively unstable political and economic environment (Klischewski & Lessa, 2013). In addition, Ethiopia has a low e-readiness profile to implement an e-government system. Among other problems, this low e-readiness of the country could be associated with scarcity of data, lack of or limited access to ICT personnel (Tekolla, 2009). Sahlu & Kim (2019) also indicated that even though there are positive achievements, Ethiopia has also come across multiple challenges in the process of implementing and expanding e-government initiatives. As a result, the failure rate of e-government initiatives in developing countries is very high (Lessa et al., 2015). Ethiopia is not an expectation in this regard. Even those e-government services that are successful may not be sustained.

Any e-government service may change the business process of an organization and meet stakeholders' expectations. By so doing, the e-government services may be considered successful by stakeholders but having a successful service does not mean it is sustainable. The majority of e-government programs fail, and the extant literature lacks a method to ensure their success and

sustainability (Lessa et al., 2011). Although organizations are still trying to deploy e-government services, many of the projects are failing (Muller, 2015). Despite the alarming failure rate of e-government efforts, especially in developing countries, e-government initiatives continue to receive significant funding. Hence, their long-term success is critical, particularly for developing countries. However, there is limited evidence of research that explores these critical issues that lead to a lack of sustainability for e-government services and possible solutions to address them (Lessa, 2012). The sustainability component of e-government initiatives is a neglected area that needs to be addressed (Lessa et al., 2015; Lessa, 2019). Hence, the researcher wanted to explore this topic due to limited literature on the issue of e-government sustainability. The fact that there is a high failure rate for e-government programs in developing countries implies that the problem is timely to explore.

1.3.Statement of the problem

E-governmental services have been provided for the last decade yet, most of them have not been efficient and sustainable particularly, in developing countries. Prior studies show that there exist variety of problems such as: lack of technology, budget and human resource constraints, all of which affect the success and long-term adoption of e-government services (Lessa, 2012). Other problems associated to this include: e-literacy, accessibility, law and policy, trust, privacy, security, interoperability, etc. (Almarabeh & AbuAli, 2010). Still, inadequate competent human resources, lack of public-private collaboration/partnerships, lack of training and knowledge transfer, lack of e-government transformation and resistance to change,low budgets and operating costs, as well as lack of a defined plan are considered to be pervasive impediments to the sustainability of e-government services (Al-Shboul et al., 2014). On top of these, low level working culture, excessive opposition, weak private sector, and low level collaboration/partnership between commercial and public sectors are all potential obstacles in implementing e-government (Belachew, M., 2010). Also, the main barriers to the implementation of e-government in developing and conflict nations are stakeholder involvement, coordination, information sharing, ICT literacy, and e-government awareness (Samsor, 2021). Lack of ICT infrastructure, public awareness of e-government services, and citizens' trust in the government are also mentioned as factors that contribute to e-government project failure in developing countries (Sharma & Pokharel, 2016). Equally important to the above mentioned factors, low level of infrastructure service also affects the maturity of e-

government by delaying the development of developing countries (Khamis & Weide, 2016). In addition to the issues listed above,maturity is one of the factors that affect the sustainability of e-government services (Lessa et al., 2015).

Due to all the above challenges, most e-government projects have failed. Joshi (2018) & Lessa (2019) argues that the majority of e-government initiatives in underdeveloped nations fail, with 35% being absolute failures and 50% being partial failures. Because of this, the main objective of the initiative was not met and/or resulted in unwanted effects. Governments' spending on ICT over the decade of the 2000s is estimated to be approximately $3 trillion. However, much of this funding is lost, with estimates ranging from 60% to 80% of e-government initiatives failing in some way (Joshi 2018;Lessa,2019)

E-government should have to be sustainable; otherwise, it is difficult to be able to benefit from its advantages manifested in various forms. However, the sustainability of electronic governance projects reveals that sustainability is well acknowledged as a concern, but there has been little evidence of study that explores this challenge and how it could be addressed so far. Sustainability is especially important in developing countries, where technology transfer is a challenge. Many e-government efforts are donor-driven, and essential stakeholders are sometimes overlooked in planning (Klischewski & Lessa, 2012). There are various factors which make e-government sustainable of which maturity is one among the factors. According to Joshi (2018), the existing maturity models were evaluated for their impact and contribution to the sustainability of e-government projects. Several observations revealed that a lack of detailed activities, a technology-centric nature, a focus on implementation, and a lack of an adoption perspective were the observed to be the bottlenecks to the sustainability of the projects. The analysis revealed that it is critical to supply sustainable e-government services in the setting of developing countries. Sustainability has become a prominent topic of discussion in the public sphere and a vital policy issue at all levels (Larsson & Grönlund, 2014). It helps for the labor force and its resources to be effectively mobilized through proper planning, government organizations to function properly, and provide effective and efficient services through good governance and accountable work ethics; which ultimately leads to a well-developed and civilized country. The field of e-government research is fairly vast and immature, and many academics are working on a variety of research projects in various areas of the field (Löfstedt, 2005).Yet , to the best of the reseracher's reading, no research

has been done on the impact of maturity on long-term sustainability. There are several frameworks, concepts, and theories that have been advanced to measure the level of maturity and sustainability of e-government projects independently and which aspects of maturity in organizations are closely related to sustainability is the gap for research (Klischwskil & Lessa, 2013). Furthermore, Searching for explanations on the determinants of e-government maturity is one of the study topics to be explored. At many levels, both country-specific and organizational-specific issues must be investigated for their impact on e-government maturity. It is necessary to examine country studies rather than cross-country research, especially when attempting to establish causal relationships (Kachwamba & Hussein,2009).

1.4.Research Questions

Thus, based on the problem statement in Section 1.3, the present study intends to answer the following basic research questions:

- What are the determinants for matured e-government services?
- What is the relationship between e-government maturity and sustainable e-government services?

1.5.Objective

1.5.1.General Objective

The main objective of this research is to develop a conceptual framework that maps e-government maturity to a sustainable e-government service. The framework is aimed at enhancing the sustainability of e-government services.

1.5.2.Specific Objectives

Based on the above general objective, this study was intended to address the following specific objectives:

- ✓ To identify the enablers of maturity and sustainability based on a review of related works
- ✓ To develop a conceptual framework that demonstrates the link between maturity and sustainability.

- ✓ To evaluate the feasibility of the proposed conceptual framework in selected case settings.
- ✓ To suggest recommendations to address challenges hindering the maturity and sustainability of e-Government initiatives.

1.6.Scope of the Study

The study's scope is restricted to address the association between e-government maturity and the sustainability of e-government services in Ethiopia on the federal government's e-government portal. Thus, the study is delimited to the case of the G2C (Government to Citizen) project; hence, e-government services at regional offices are out of the scope of this research.

1.7.Significance of the Study

The findings of this study would benefit for both researchers and practitioners. This study tried to explore a less-studied topic of e-government sustainability and specifically, attempted to fill the gap observed in the previous research by identifying the association between maturity and sustainability through developing a conceptual framework that maps the enablers of maturity with sustainability. Thus, it can be used as an input for other researchers as a reference to make further investigation on this specific area. The study suggests a way of enhancing the sustainability of e-government services by identifying indicators of maturity that enable sustainability.

The research is expected to have a theoretical contribution which could be used as inputs for policymakers and practitioners. The study may also benefit practitioners to have matured e-government service and thereby reduces the cost for development, improves the system's performance, efficiency, and effectiveness. This situation may in turn build trust, reduce corruption, and have a better political situation in the country and the e-government services can be accepted and trusted by all citizens over time. The results of this study would also help other government organizations to document and learn about the interaction between maturity and sustainability of e-government services.

1.8.Organization of the study

The remaining part of this thesis is organized into four chapters. Chapter two reviews the literature on e-government maturity, e-government sustainability, and related disciplines in terms of the basic concepts, theories, and empirical works. The third chapter presents research methodology which constitutes research approaches, strategies, site and case selection, sampling technique, data collection methods, data analysis technique, and reliability and validity assessments. The data presentation, analysis, and discussion are all covered in Chapter Four. The final chapter, concludes the study and presents recommendations of action to have sustainable e-government service. The chapter also points limitations of the study and outlines suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

Chapter two presents an in-depth analysis and discussion of related literature. To create a context for the study and introduce basic concepts, the chapter starts with an introduction to electronic government followed by e-government services and their types. It mainly focuses on the two key constructs in this research (e-government maturity and Sustainability) and their related variables/attributes. The chapter ends with an extended presentation and synthesis of a review of related works to figure out the research gap which this research is aiming to fill.

2.2. E-Government: Definition

Electronic government (e-government) is a 21st-century technological innovation that aims to improve citizen satisfaction by utilizing Information and Communication Technologies (ICT) such as the Internet and the Web (Ifinedo, 2011; Ifinedo, 2012; Al-Shboul et al, 2014; Almuftah, 2016). It has evolved into a critical tool for delivering government services in a more efficient, effective, and transparent manner (Joshi, 2018).

Different scholars and institutions define e-government in different ways. According to UN, it refers to government agencies' use of information and communication technologies (ICT) such as Wide Area Networks, the Internet, and mobile computing by government agencies (UN Survey, 2010). E-government is also described as the use and application of information technology in government to simplify and integrate workflows and processes, manage data and information effectively, improve public service delivery, and increase communication channels for citizen involvement and empowerment. (UN E-Government Survey, 2014: 02). It refers to the use of information technology by government agencies (such as Wide Area Networks, the Internet, and mobile computing) to change relationships with individuals, corporations, and other government agencies. These technologies can be used to achieve a range of goals, including better service delivery, increased relationships with business and industry, citizen empowerment through

information access, and more effective government administration. The subsequent benefits can be minimizing corruption, increasing transparency, enhancing convenience, improving revenue, and/or reducing costs (World Bank, 2006).

Though different definitions of e-Government exist, the majority of them consider it to be the government's use of information communication technologies to allow citizens and businesses to interact and conduct business with the government through electronic media such as the telephone touchpad, fax, smart cards, self-service kiosks, e-mail / internet, and EDI. It's about how government functions: administration, rules, regulations, and frameworks for delivering services and organizing, communicating, and integrating operations inside the organization (UN Survey, 2010). Even though there are numerous definitions of e-government in this research, the researcher uses the most frequently cited definition in the literature as indicated below:

> "*Electronic government refers to government's use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities*". (Layne & Lee 2001; Al-Khatib, 2009).

2.3. E-Government services

E-services are new area that is quickly gaining popularity and relevance. Citizens expect and demand government services that are of high quality, quantity, and availability of 24 hours a day, seven days a week, and last all year round (Löfstedt, 2005). E-services are called the 'overarching transactional journey,' which is made up of smaller interactions between employees and customers, customers and technology and technology and employees (Kotamraju & Geest, 2012). Modern e-governments not only require an online presence, but also use the internet to deliver a variety of services to other government agencies, individuals, and enterprises (Chaushi et al., 2015). In this regard,there are three types of services, namely: Government-to-Government (G2G), Government-to-Business (G2B), and Government-to-Citizens (G2C).

G2G refers to activities that enable government agencies to communicate with one another in terms of information sharing and online transactions. (Carter & Belanger, 2004; Löfstedt, 2008; Chaushi et al., 2015).

G2B activities are those activities which enable companies to get timely government information and perform transactions with government agencies. Examples of this type of services include: online electronic tax filing, electronic financial report submission, employee insurance payment, and electronic procurement (Carter & Belanger, 2004; Löfstedt, 2008; Chaushi et al.,2015).

G2C activities are those in which the government gives people one-stop, online access to information and services (Palvia & Sharma, 2007). Citizens can use G2C services to get government information and execute government activities online, such as downloading paperwork, paying taxes, renewing their driver's license, and so on (Carter & Belanger, 2004; Löfstedt, 2008; Chaushi et al., 2015). According to Syamsuddin (2011), the government's approach to launching an e-government initiative in the government-to-citizen (G2C) dimension is challenging for developing nations, particularly when e-government systems are not connected.

2.4. Benefits of E-government services

E-Government transforms governments into "smart governments," improving citizens' social, political, and economic inclusion as well as their quality of life (Apleni & Smuts, 2020). E-government activities are intended to improve government performance around the world. The successful execution of these measures is projected to improve the quality of public services supplied to citizens and the private sector, increase the efficiency and effectiveness of internal government operations, and increase citizen engagement in decision-making processes (Klischewski & Lessa, 2013).

E-government makes the government more transparent and efficient. Moreover,it enables citizens to receive government information and services much more quickly and easily (Almarabeh & Abuali, 2010). It further reduces government operational costs and enhances the quality of service delivery to residents. Still, it fosters transparency and accountability in government operations, and increases citizen engagement in decision-making (Belachew, 2010). It also makes government services more efficient and accessible to citizens (Ifinedo & Singh, 2014). These technologies can be used to achieve a range of goals, including better citizen service delivery, increased relationships with business and industry, citizen empowerment through information access, and more effective government management. Al-Shboul et al. (2014) also pointed out that less

corruption, increased transparency, greater convenience, income growth, and/or cost reductions are the possible outcomes of e-Government initiatives. E-government fosters good governance, improves democracy, and results in the growth and development of developing countries (Kuhbanani et al., 2021). Citizens have easier access to government information and services due to e-government. Better services and more access result in more productive connections between citizens and governments. In other words, creates favorable attitude among citizens about governance (Ifinedo, 2012). Figure 2.1 summarises the benefits of e-Government.

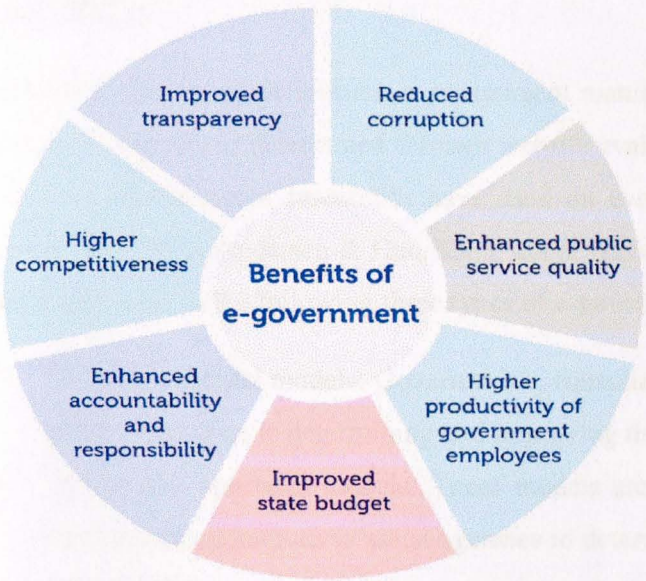


Figure 2.1: Key Benefits of E-government (Source: RMIT University Website,2020)

A country's e-government maturity is expected to bring several benefits such as: increasing savings, gaining efficiency, improved quality of service delivery to citizens and businesses; transparency, anti-corruption, accountability, and democratization; and increased national and business competitiveness (Kim, Kim, & Lee, 2009; Ndou, 2004; Sang & Lee, 2009; Srivastava and Teo, 2007; Von Haldenwang, 2004; Krishnan et al., 2017). Yet, government agencies in most countries confront challenges in expanding e-government and gaining maturity (Krishnan et al., 2017).

2.5. E-Government Maturity

The term "maturity" refers to a stage of development in a process ranging from lower to higher stages or phases (Galliers & Sutherland, 1991; Andersen & Henriksen, 2006; Ifinedo & Singh, 2011). The maturity of electronic government (e-government) is defined as the extent to which a country's government has established an online presence (Krishnan et al., 2013; Singh, Das, & Joseph, 2007; UN-Report, 2012; Krishnan et al, 2017). This level of growth of a country's online services and people's online participation in governance is referred to as e-government maturity (Ifinedo, 2012).

In addition to the above definitions, e-government maturity refers to a country's real level of e-government progress as determined through website evaluation (Kachwamba & Hussein, 2009). Some prior e-government researches have used an evolutionary approach to define maturity (Layne & Lee, 2001; Andersen & Henriksen, 2006; Das et al, 2011). In this regard, according to Concha et al. (2012), the following three types of e-government maturity models were identified:

- ✓ The governmental models: Governments, consultants, and academics create these models to assist agencies in determining and improving their degree of e-government maturity.
- ✓ The holistic approach models: These models are intended to be used in public service development initiatives to assist agencies in determining whether or not an e-government project will succeed.
- ✓ The evolutionary e-government maturity models: These models concentrate on the progression of e-government through a series of levels, such as from immature to mature e-government with higher quality.

The researcher considers the third category (i.e. the evolutionary e-government maturity models) because the purpose of this research is to investigate the existing maturity modes to figure out their features and characteristics of e-government maturity. That in turn would help to identify the determinants of e-government maturity (matured e-government services) and pave a way to find out how e-government maturity is related to e-Government sustainability.

2.6. E-Government maturity models

E-government maturity models, also known as stage models, guide the development of e-government programs (Joshi & Islam, 2018). In the literature, there are several e-government maturity models. The e-government maturity model has provided a technique for assessing the maturity of an organization's processes and defining the key practices required to improve their maturity (Al-Khatib, 2009). A maturity model is also the conceptual framework that illustrates how e-government initiatives should be implemented in phases (Layne & Lee, 2001; Reddick, 2004; Joshi & Islam, 2018). They are also important in developing sustainable e-government services since they give a strategic framework for implementing e-government initiatives (Almarabeh & AbuAli, 2010). Ranging from basic to advanced online interaction skills, the e-government maturity model is divided into different phases (Almuftah et al, 2016). These phases indicate how far a country has progressed in terms of e-government maturity. As a result, maturity models in this context reflect a progression from a lower to a higher stage of development (Kachwamba & Hussein, 2009). However, the stage models share several characteristics (Almuftah et al, 2016) and phases as shown in Table 2.1 on annex B.

2.6.1.The focus of the e-government maturity stages

According to Fath-Allah et al. (2014), the stages of the e-government maturity model are classified by their focus (as described in the subsection connected to the maturity models' stage names). The terms "presence", "interaction", "transaction" and "integration" are used interchangeably. Table 2.2 shows how the maturity stages are divided into groups based on their focus.

Table 2. 2. The focus of the e-government maturity stages.

Maturity stage	Focus	Description	Maturity models
The first stage of all maturity models is primarily concerned with presence on the Web."	Presence	Different models use different words even though they all concentrate on the same topics that are "presence on the Web" (present, emerging information, presence on the web, information, presence, information interaction, Web presence, bill-board, simple information dissemination, publish information publishing, online presence, initial conditions, catalogue, cataloguing and basic site).	All models expect Andersen & Henriksen(2006) and Wescott(2001)
The second stage of all maturity models focuses on allowing citizens to access more information via the portal as well as communicate and transact with the government. Which are categorized into three groups	Interaction	Citizens can interact or communicate with the government	Alhomod et al. (2012), Hiller and Belanger(2001), Gartner(2000), Moon,(2002) WorldBank(2003), Deloitte &Touche(2000), Howard(2001), Shahkooh et al. (2008), Siau & Long(2005), Chandler & Emanuel(2002), Kim & Grant (2010) and Windley(2002)
	Enhanced information	This implies that the information quality has improved.	UN(2012), Almazan & Gil-Garcia(2008)) and UK(2012)
	Transaction	This means that citizens can do full transactions on the web.	Layne and Lee(2001), Cisco(2007), Chen et al. (2011)

Maturity stage	Focus	Description	Maturity models
All maturity models' third stage is primarily focused on letting citizens interact and transact with the government, and making the e-portal a true one-stop-shop.	Transaction	This refers to the ability of citizens to conduct entire transactions through the web.	UN(2012), Alhomod et al. (2012), Hiller and Belanger(2001), Gartner(2000), Moon(2002), WorldBank(2003), Howard(2001), Shahkooh et al. (2008), Siau & Long(2005), Wescott(2001), Chandler & Emanuel(2002)and Kim and Grant(2010)
	Interaction	This refers to citizens' ability to communicate with the government.	Almazan & Gil-Garcia(2008).
	Integration (transformation, single point of entry)	Refers to the transformation of data and the creation of single-point-of-entry portals.	Layne and Lee(20001), Cisco(2007), West(2004), Deloitte & Touche(2000), Chen et al. (2011) and Windley(2002).
The fourth stage of all maturity models is primarily focused on allowing citizens to transact with the government and integrating and personalizing the e-portal to meet the demands of citizens.	Integration (transformation)	Refers to the interoperability and harmonization of systems and e-portals.	Layne and Lee(2001), Andersen and Henriksen(2006), UN(2012), Alhomod et al(2012), Hiller & Belanger(2001), Gartner(2000), Moon(2002), Shahkooh et al(2008), Siau & Long(2005), Chandler and Emanuel(2005), Kim & Grant(2010), and Windley(2002).
	Transaction	This refers to the ability of Citizens to conduct entire transactions through the internet.	Almazan & Gil-Garcia(2008), UK(2012)

Maturity stage	Focus	Description	Maturity models
	Personalization	This indicates that the e-portal may be tailored to the demands of the citizens.	West(2004), Deloitte & Touche(2000).
All maturity models' fifth stage is primarily focused on e-participation and integrating the e-portal.	E-participation (political participation)	Citizens can participate in forums, online voting, and surveys which includes political involvement	Hiller & Belanger(2001), Moon(2001), Shahkooh et al. 2008), Siau & Long(2005), Wescott(2001), Kim & Grant(2010)
	Integration	Refers to the ability of systems and e-portals to communicate and function together.	Almazan & Gil-Garcia(2008), Deloitte and Touche(2000) and UK,(2012)
All maturity models' sixth stage is primarily focused on political engagement and integrating the e-portal.	Political participation	Refers to people's ability to vote and participate in the national election	Almazan & Gil-Garcia(2008).
	Integration	Refers to the ability of systems and e-portals to communicate and function together.	Deloitte & Touche(2000), and Wescott(200).

Source: Fath-Allah et al., 2014

2.6.2.Maturity models' stage features

Most of the e-government maturity models were built without any input from others when it came to the stage features of maturity models. Because alternative language has been used to express the same or equal attributes in this situation, or because the same features have been described in different words (Fath-Allah et al., 2014).

In the report of Fath-Allah et al. (2014), among the key elements provided in the 25 maturity models offered, the following six features were selected.

One-stop-shop: All e-government services are accessible through the e-portal, which acts as a single point of entry.

Customer Centricity: This indicates that the services or e-portal were designed for citizens rather than organizations in view.

Interoperability: This system consists together organizations collaborating and sharing information.

Personalization: This implies allowing citizens to customize and adjust the e-portals to meet their requirements.

Payments: This incorporates allowing individuals to pay through the e-portal using credit/debit cards or electronic banking.

E-participation: This refers to people's participation in the e-government process through the use of various technologies such as comment forms, surveys, e-voting, and e-petitioning

Table 2. 3. Features coverage per each maturity model

Stages / Features	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5 and above
One-stop shop			West MM, Deloitte & Touche MM	(Layne & Lee, 2001), (Hiller & Belanger, 2001), (Shahkooh et al., 2008), (Siau & Long, 2005)	(Almazan & GilGarcia, 2008),(Wescott,2001), (N.A.O.,2002), (Netchaeva, 2002)
Customer Centricity			Deloitte & Touche MM, Accenture MM	(Andersen & Henriksen,2006), (United-Nations,2012), (Almazan & Gil-Garcia,2008), (Windley, 2002)	(Rohleder & Jupp, 2003)
Interoperability	Andersen & Henriksen MM		(Layne & Lee, 2001), (Cisco IBSG, 2007), (Chen et al., 2011), (Rohleder & Jupp, 2003)	(United-Nations,2012), (Alhomod et al., 2012), (Hiller & Belanger, 2001), (Baum & Di Maio,	(Almazan & GilGarcia, 2008), (Deloitte Consulting & Deloitte & Touche, 2000),

Stages / Features	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5 and above
				2000), (Moon, 2002), (Shahkooh et al., 2008), (Lee & Kwak, 2012), (Siau & Long, 2005), (Chandler & Emanuels, 2002), (Kim & Grant, 2010), (Windley,2002), (Layne & Lee, 2001)	(Lee & Kwak, 2012), (Wescott, 2001), (N.A.O., 2002)
Personalization	Cisco MM	Andersen & Henriksen MM	(Andersen & Henriksen, 2006), (Almazan & GilGarcia, 2008), (Cisco IBSG, 2007), (Siau & Long, 2005), (N.A.O., 2002)	(Almazan & Gil-Garcia, 2008), (Baum & Di Maio, 2000), (West, 2004), (Deloitte Consulting & Deloitte & Touche, 2000), (N.A.O., 2002)	(Deloitte Consulting & Deloitte & Touche, 2000)
Payments		Cisco MM, Deloitte & Touche MM, Windley MM, Reddick MM	(United-Nations, 2012), (Alhomod et al., 2012), (Hiller & Belanger, 2001), (Baum & Di Maio, 2000), (Moon, 2002), (Howard, 2001), (Shahkooh et al., 2008), (Siau & Long, 2005),(Deloitte Consulting & Deloitte & Touche, 2000), (Kim & Grant, 2010)	(Almazan & Gil-Garcia, 2008), (Wescott, 2001), (Windley, 2002), (N.A.O., 2002), (Netchaeva, 2002)	(Wescott, 2001)

Stages / Features	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5 and above
E-participation		Layne & Lee MM, Hiller & BelangerMM, Moon MM, World Bank MM, Howard MM, Lee & Kwak MM, Windley MM	(United-Nations, 2012), (Almazan &GilGarcia,2008), (Cisco IBSG, 2007), (Lee & Kwak, 2012), (Wescott, 2001), (Netchaeva, 2002)	(United-Nations, 2012), (West, 2004), (Lee & Kwak, 2012), (Rohleder & Jupp, 2003)	(Hiller & Belanger, 2001), (Almazan & GilGarcia, 2008), (Moon, 2002), (Shahkooh et al., 2008), (Siau & Long, 2005), (Lee & Kwak, 2012), (Wescott, 2001), (Kim & Grant, 2010), (Netchaeva, 2002)

Source: Fath-Allah et al., 2014

2.7.Determinants Of E-Government Maturity

Extant literature shows that the determinants of e-government maturity at the country level are different from the organizational level. The determinants of e-government maturity at the country level could include macro-environmental factors such as level of Gross Domestic Product, human capital, ICT infrastructure and rule of law (das et al, 2011; Ifinedo & Singh, 2011; Ifinedo, 2012; Krishnana et.al,2017). Macro variables have a role in defining e-government maturity at the national level, but they don't always explain variances in e-government maturity across government agencies within the same country. Sometimes even in the top-ranked counties, there is variance in e-governmental maturity among different governmental agencies. Due to such reasons, organizational specific elements are critical in defining the maturity level of organizational e-government (Kachwamba & Hussein, 2009).

Organizational specific factors explain why some agencies are making more progress than others. These factors may have differences within countries (Kachwamba & Hussein, 2009). There are numerous factors in literature, such as ICT infrastructure development, human resource capability, leadership and management at the organizational level (Oyomno, 1998). Other factors include website age, size of the organization, manager's professionalism, and location of an organization

on e-government (Norris & Moon, 2005; Reddick, 2004). Still, managers commitment to prioritize e-government projects, availability of an ICT department with an independent annual budget e-government development, degree and frequency of customer contacts and organizational e-government operational plan are also mentioned as potential factors (Kachwamba & Hussein, 2009). Therefore in this study, both country level and organizational specific determinants are examined.However, to show the relationship between e-government maturity and sustainability organizational specific determinants were used.

2.7.1. Country-level determinants of e-government maturity

GDP per capital : A country's overall level of wealth, as measured by its gross domestic product, is referred to as its national affluence (GDP). Wealthy countries may have more resources to invest in improving administrative capacities, such as expanding the use of ICT to assist government tasks. Less developed nations, on the other hand, must concentrate on enhancing conventional government modes and channels. Wealthier nations with more financial resources make more progress in terms of the types and extent of quality features and services given or visible on their government websites than their less affluent counterparts (Singh et al., 2007; West, 2007). Previous studies have discovered a link between wealth and e-government (Das et al. 2009; Srivastava & Teo, 2010; Ifinedo & Singh, 2011; Ifinedo, 2012). National wealth has both direct and indirect relationships with e-government maturity and also, it is served as an enabler in the proposed research conceptualization.

Human capital: According to Sign et al. (2007), the degree of human capital in a country especially, the population's literacy, which is defined as the percentage of adults who can read and write clearly, or the proportion of the school-aged population enrolled in primary, secondary, or higher educational institutions is likely to influence the growth of e-government. Reviews on a number of previous research suggest that there is a relationship between education and the usage of the internet. When online e-government services are available, better informed individuals not only use them, but also encourage additional government entities to do so. Users of e-government Web sites tend to be young males with a high level of education and money (West, 2004). Low educational attainment and illiteracy have a negative influence on social transformation and the

establishment of an information society (Norris,2001; Barker,2005; Caselli & Coleman ,2001; Karunasena et al., 2011; the World Economic Forum, 2011).

The human capital index was shown to be positively associated to e-government maturity across countries (Moon et al. 2005; Singh et al., 2007; Ifinedo & Singh,2011; Ifinedo, 2012; Krishnan et al., 2017). The findings of the study by these scholars show that countries with good human capital resources have a higher capacity to use innovation such as e-government for development.

ICT Infrastructure: The status of an ICT infrastructure can be expected to influence the maturity of e-government in a country. Because such infrastructure restricts the number of citizens who may benefit from e-government services. Countries with a greater per capita GDP can afford more widespread, high-quality physical ICT infrastructure. Citizens are increasingly inclined to do their business online as ICT availability improves (Sign et al., 2007). Additionally, the type of the applications that may be deployed for e-government is limited by the quality of the infrastructure. Rich media (music and video clips) on e-government Web sites are limited by the bandwidth available to home Internet users. Transaction capability, if implemented at all, is unlikely to be used without stable connections. It is clear that achieving high quality in a country's ICT infrastructure requires significant investment, which is likely to be one of the reasons at why more affluent countries have an advantage in e-government. In this study, ICT infrastructure refers to a country's level of information and communication technology development. The level of ICT development directly assists or hinders the creation and delivery of e-government services to the public at large (Shareef et al., 2011; Srivastava & Teo 2010). Citizens in nations with more advanced ICT infrastructure are also more inclined to do government-related business online (Singh et al., 2007; Das et al., 2011).

Studies by Singh et al. (2007), Norris (2001), Moon et al. (2005), and Azad et al. (2010) demonstrated that new innovations proliferate when supporting technical infrastructure exists. Moon et al. (2005) discovered that the more technologically sophisticated (i.e., having a greater degree of technical infrastructure) a country is, the more likely it is to advance its e-government programs and agenda. Singh et al. (2007), Azad et al. (2010) and Ifinedo and Singh (2011), among others, concluded that the availability of technology infrastructure had a positive impact on e-government maturity across countries.

Rule of Law: The term "rule of law" refers to a country's solid political structures, fair processes, and legal protection of property rights (Shih et al., 2005). Previous research has found that it has an influence on the spread of e-commerce and e-government (Oxley & Yeung, 2001; Welch & Wong, 2004; Katchanovski & La Porte, 2005). It has been stated that developing nations lag behind advanced countries in technology advances such as e-government due to poor or non-existent national governance institutions such as the rule of law (Azad et al., 2010). It is reasonable to believe that when the rule of law is advantageous, sophisticated features that allow public engagement and empowerment in government would be easy to implement. According to Welch and Wong (2004) and Kovai (2005), governments in countries with a weaker "rule of law" may have little or no interest in offering sophisticated features on their websites that encourage public interaction and empowerment since such enhancements may be seen as encouraging disagreement. As stated by Ifinedo and Singh (2011), the rule of law is one of the possible determinants of e-government maturity.

2.7.2.Organizational Specific Factors as a Determinant of E-Government Maturity

ICT infrastructure development: ICT infrastructure is one of the capability factors for e-government. It serves as the technical operating platform for a range of ICT applications as well as the foundation of e-government services. The ICT infrastructure generally includes the following four components: Access and connectivity, databases and data warehouses, and business continuity solutions are all examples of ICT networks. ICT networks conventionally include a combination of local area networks (LANs) and various forms of wide-area networks (WANs).

Access and connectivity: refers to the extent to which organizational members and stakeholders have access to ICT hardware and services. It evaluates the level of access to telecommunication services (including landline and mobile), the Internet and related services, and personal computers or workstations for organizational members. The same statistic is used for stakeholders of the organization, but to determine the proportion of stakeholders who have electronic access to the organization and its services. Databases and data warehouses are critical components of all electronic interactions and transactions because they store and manage the necessary data. Databases are the repository of active business records inside an organization. Business continuity

systems (BCS) guarantee that the electronic business environment is safe and secure and that it is not threatened or disrupted. In the sense that an organization's ICT infrastructure shapes the type and breadth of its applications portfolio, and therefore its e-applications, examining the organization along these dimensions reveals its e-government maturity (Oyomno, 1998).

Human resource capability/human and intellectual capability: Human intervention is crucial to an organization's ability to complete any activity linked with its business. Even when the most powerful technology is employed to complete a task, human participation will always be required at some point. Human specialists bring specialized knowledge and skill to bear on such actions, which guides such initiatives. Human and intellectual "capital" since such talents and knowledge are deployable assets and hence are considered organizational capital. As a result, the researchers distinguish clearly between human resources and human capital. Human resources are viewed as a potential that have yet to be developed for future exploitation, whereas human capital is viewed as a finished product that is ready for deployment and exploitation. Without a doubt, a country's human capital resources have an impact on the adoption of e-government. Human issues such as a lack of ICT skills and knowledge in the public sector, education, and insufficient communication and marketing of e-government services are all possible reasons for e-government programs to fail (Kappelman et al., 2006). In the case of e-government, skills, expertise, and competencies in the areas of business skills and competencies, conceptual competencies, technological competencies, institutional "capability development" competencies, social networking and "teaming" competencies, and leadership competencies will be required for the successful development and implementation of mission-critical initiatives. The maturity of a government's e-government skills is measured by the degree to which it possesses certain competences in its human and intellectual capital repository or has access to them from other sources (Oyomno, 1998).

Leadership and management at the organizational level: Any organization's success depends on its ability to lead and manage, but there are differing perspectives on what each term means and how they relate to one another. Some people believe that planning, organizing, leading, and controlling are the four management tasks. Others feel that leadership and management are two separate but complementary concepts. However, e-government is about establishing a new era government, and it needs the right mix of management and leadership (Oyomno, 1998).

Website age : According to Norris and Moon (2005), Website age is the age of local government web sites. The first local government Web sites, those created by early adopters, were primarily informational. That is, static information that site visitors can read. This is also true of certain early sites created by governments that eventually adopted the technology. Many late adopters, on the other hand, have learnt from the mistakes of early adopters and have begun with sites that contain more than simply static material. Users can download information from sites with the next highest degree of complexity (that is, sites that provide more than just one-way information). Governments also enabled residents to communicate, generally by e-mail, somewhere along the line, usually in the first and second levels of complexity. Government websites get even more transactional potential as they become more sophisticated. As a result of this, citizens will be able to conduct business with the government online. The next level of sophistication is informational, transactional, and horizontally (inside the government) and vertically linked sites (across governments). The more advanced sites use the latter to give complete portal functionality. In general, e-government services are evolutionary; they progress from time to time and it reach to the maximum level of maturity when the age of the web increases.

Organizational size : The size of an organization has been demonstrated to have a beneficial impact on IT innovation adoption (Walker, 2014). "Organizational size is the best predictor of innovation" (Aiken & Hage, 1971; Damanpour, 1992; Dewar & Dutton, 1986; Ettlie et al., 1983; Kimberly & Evanisko, 1981; Moch & Morse, 1977; Sullivan & Kang, 1999, Camisón-Zornoza et al., 2004, p. 332). The resources and capacities of bigger organizations are more complicated and diverse (Nord & Tucker,1987, quoted in Camisón-Zornoza et al.,2004, p. 339). On the other hand, smaller organizations display greater agility and flexibility (Lee & Xia, 2006, p. 976). In most literature from lower to higher stages of maturity models, technological and organizational complexity rises, and this indicates that the maturity of the e-government depends on the size of organization (Kachwamba & Hussein, 2009).

Manager's commitment to prioritize e-government projects: Managerial behavior, support, and attitude toward ICT projects are all important variables in the public sector's ICT transformation (Michael et al.2018). In order to distribute and supply enough resources, support and dedication from high management are essential throughout the full e-services deployment life cycle (Apleni & Smuts,2020).

Availability of an ICT department with an independent annual budget e-government development: The e-government initiative is managed by the government body's IT department. In order to realize this initiative, sufficient funding must be supplied (Othman & Razali,2018). IT department has a huge role on adoption and implementation of e-government services. When projects are executed by third parties, they function as users, and the system requirement is created according to their specifications (Dias et al.,2014). IT department owns the system after execution to manage and maintain.

Degree and frequency of customer contacts: Due to the significant pressure from public demand (Reddick, 2004), firms with high and frequent customer connections are more likely to be identified at higher stages of e-government maturity than organizations with minimal customer contacts. These organizations have a significant number of client encounters, necessitating the expansion of front-office online services (Walley, 1994; Kachwamba & Hussein, 2009). E-government services are part of front-office operations, and they strive to meet the demands of the public by making interactions with various online services easier. Organizations with a high level of consumer engagement might include, for example, all organizations in the UN e-government survey sectors of education, health, employment, and social welfare (Kachwamba & Hussein, 2009).

Organizational e-government operational plan: A clear vision and strategy that guides and supports the whole e-government implementation process and focuses on the achievement of specified and well-articulated e-government goals are required for successful e-government considerations (Apleni & Smuts, 2020).

Legal and Political Strategies: According to Michael et al. (2018), while e-government is an institutional issue, rules and regulations should be in place to support the policy. Adoption might be jeopardized by a lack of legal foundation (Esteves & Joseph, 2008). In the absence of a legal foundation, the e-government decision-making process should be formalized to assure openness and ease the procedure (Henningsson & Veenstra, 2010). On the other hand, other writers argue that legal and regulatory limits cause a mismatch with e-government practices (Mahler & Regan, 2002). The lack of legislation protecting people' rights, as well as data privacy and data security

regulations (Choudrie et al., 2005), results in a lack of e-government credibility and, as a result, failure.

2.8.E-Government Sustainability

The capacity to preserve and sustain the potential for life across time is referred to as sustainability. This involves addressing present demands without harming future generations' capacity to meet their own. Due to such reasons, sustainability is the foundation of improving both the current and future human situation, it is stated that humans have the power to produce sustainable development to fulfill their requirements without affecting future generations' demands. (Kuhbanani et al, 2021). The capacity to preserve and sustain the potential for life across time is referred to as sustainability (Tiboris, 2017). To achieve long-term economic, social, and environmental sustainability, any government must establish the strategy of procedures, processes, and results of both good governance and electronic government (e-government) initiatives (Dhaoui, 2021).

Governments in developing countries are under a lot of pressure to create long-term e-government services (Janssen & Estevez, 2013). Sustainable e-government services should be capable of assisting governments in achieving their objectives while also being simple to use (Lin et al., 2011). Additionally, long-term e-government services should be able to deliver a return on investment in terms of service quality, wider acceptance and adoption of supplied services, e-government implementation cost, and operational efficiency (Rowley, 2011). Furthermore, the prolonged lifespan of e-government services and the ability to make technical changes as needed are two crucial elements of a sustainable e-government (Curry & Donnellan 2012;Kuhbanani et al., 2021). As a result, e-government will be effective if it is sustainable and forward-looking (Hooda & Singla, 2020).

2.9.Determinants of e-government sustainability

From the extant literature, Klischewski and Lessa (2011) identified about eighteen enablers of e-government sustainability: Continuously much available resource, cultivating an influential champion, using IT to enhance development, independent from external assistance, develop senses of ownership, sustaining political leadership, ongoing monitoring and evaluation, understanding of local political dynamins, continuously meet stockholders' need, institutionalize the project into

vision. Furthermore, Joshi and Islam (2018) investigated the five determinants of e-government sustanability from the existed e-government maturity models that are detailed Assimilation Process, Streamlined Services, State-of-The-Art Technology, Agile Accessibility, Awareness And Trust Among Citizens etc..

Long term vision : Lack of guidance and link between goals and procedures (Heeks 2008), uncoordinated and isolated initiatives, and distributed responsibilities owing to multiple ownership (Cloete, 2004) come from the absence of a long-term vision (Backus, 2001) and integrated execution plan (Sarantis et al., 2011; Ndou, 2004). Based on the report of Dzhusupova et al. (2011), vision and strategy is one of the challenges which affects sustainable e-government.

Independent from external assistance: Many e-government efforts in developing countries are reliant on aid agencies, suppliers, and consultants because of lack of financial and human resources, making them particularly susceptible when outside financing expires (Heeks 2003; Grönlund et al. 2005; Furuholt & Wahid, 2008). Isolation, fragmentation, and duplication of applications may be encouraged when donors collaborate with separate agencies (Hanna & Qiang, 2005; Deane & Schware, 2003). As stated by Klischewski and Lessa (2012), this affects the long-term viability of e-government initiatives in developing countries.

Develop senses of ownership: On the report of Dzhusupova et al. (2011), lack of national ownership (Heeks, 2001; Sarantis et al., 2011) leads to a lack of a coherent e-government strategy (Ronaghan, 2002), little consideration of the local context (Dada, 2006), and cultural and social issues (Cloete, 2004; Schuppan, 2009; Bhuiyan, 2011; Kumar & Best 2006), and little consideration of the local context (Dada, 2006; UNDESA, 2008). The causes for this are reliance on external specialists (Ali et al., 2009; Grönlund et al., 2005; Heeks, 2003), and disregarding the primary stakeholders in e-government planning, resulting in a lack of ownership and the dominance of politics and self-interest (Heeks, 2001; Stanforth & Flynn, 2008). So, developing sense of ownership is one of the determinant factors of sustainability.

Sustaining Political leadership: Lack of leadership at various levels of government, particularly sustained political leadership (Heeks ,2001; Grönlund et al., 2005; Kifle et al., 2009; Backus, 2001; OECD, 2003), lack of commitment from top management and senior officials, resulting in resource misallocation and sending a negative message to other groups, lack of commitment from top

management and senior officials (Furuholt & Wahid, 2008; UNDESA, 2008; Rose & Grant, 2010 cited in Dzhusupova et al., 2011)

Financial management: The goal of financial management is to improve the government's financial structure and ability to meet its obligations and pay off debts in order to achieve national goals, particularly, economic goals. Financial management has made initiatives to promote sustained e-government, including investing through Easy Payment Systems (Cordella & Tempini, 2015), cost efficiency (Amini & Bienstock, 2014), and offering government incentives (Galpin et al., 2015). Furthermore, money is a critical issue in launching government programs, especially, long-term e-government initiatives (Aras & Crowther, 2008).

Service provision management: In e-government, services determine people's levels of satisfaction and demonstrate the maturity of the system (Kumar, Baishya, Sadarangani, & Samalia, 2020). The goal of this element is to improve government performance by employing electronic devices to measure, assess, and improve government performance in attaining strategic goals and enriching its mission and values (Brown, Delbaere, Eeles, Johnston, & Weaver, 2005; Fitzsimmons & Fitzsimmons, 2006; Hefley & Murphy, 2008; Wolfson, Tavor, & Mark, 2013). Without upgrading its procedures and programs, an e-government will not be able to function in the long run (Al-Mashari, 2007).

Management of human resources competencies: This is a list of several actions aimed at providing the business with skilled personnel and assuring pleasure from the opportunity to use their skills. Employees in government organizations may lack sufficient awareness about information technology and have not received proper training for its successful use; as a result, they fight important changes. Meanwhile, to apply their updated e-government capabilities, government sector staff must have the appropriate skills and competencies to deploy sustainable IT e-government (Sorn-In et al., 2015). As a result, in order to provide general value through the provision of new services, HRM necessitates the deployment and development of technical personnel, as well as their understanding of relevant e-government service expertise, (Aniscenko et al., 2017). Human resource management acts as an umbrella for e-government, allowing it to be implemented efficiently (Nam, 2018; Kuhbanani et al., 2021)

Legal requirement: Rules are at the basis of government as they influence the system's procedures and behavior (Corradini, Polzonetti, & Riganelli, 2018). The implementation of sustainable e-government, like that of e-government, needs the assistance of government law and law enforcement administrators (Sorn-In et al., 2015). Rules and regulations are an effective factors in the implementation of sustainable e-government, because they play a constructive role in resolving related challenges, improving coordination between related sectors, providing technical facilities, assisting in the implementation of infrastructure projects, and strengthening institutional goals (Whitehead, 2017; Kuhbanani et al., 2021)

Citizenship communication management: This idea is a form of management approach that focuses on maintaining and optimizing connections with citizens through the use of technology and a strong emphasis on citizens. It is used to enhance new types of public engagement in government (Schellong, 2005). This link between government and citizens plays an important role in the development of e-government by boosting accountability and encouraging information disclosure (Alcaraz-Quiles, Navarro-Galera, & Ortiz-Rodriguez, 2015). Citizens' trust (AlAwadhi & Morris, 2009), active electronic involvement (Amran & Keat Ooi, 2014; Birrer, 1999), citizens' reception and reception complaints, and more open communication between government officials and citizens can also be accomplished (Joshi & Islam, 2018).

Infrastructure management: The stable e-government skeleton is built on top of a long-term IT infrastructure. Without the establishment of sufficient infrastructure that supports sustainability initiatives, implementing sustainable methods is constrained (Galpin et al., 2015). Information technology, like a two-sided coin, may either be a source of opportunity or a source of danger. Sustained e-government must take into account the quality of end-to-end information technology in order to provide long-term value to its stakeholders while not jeopardizing future generations' demands (Windolph et al., 2014). With the use of new efficient technology, this technology can provide state-of-the-art services in a safe and collaborative manner while being cost effective and cost-cutting (Kuhbanani et al., 2021).

Electronic information management: In order to assure the existence of quality information, the information systems required to support the operations of a government organization are linked to societal evolution in sustainable e-government (AlAwadhi & Morris, 2009). Increased access to information on the Web, as well as the completeness and timeliness of information on websites,

creates an information society (Al-Mashari, 2007), citation capacity, correctness, and high integrity (Sorn-In et al., 2015; Alzahrani, Al-Karaghouli, & Weerakkody, 2017; Bailey, Strezhnev, & Voeten, 2017). In this context, information quality should be enhanced, with special emphasis paid to security and privacy, in order to build public confidence and minimize resistance to change (AlAwadhi & Morris, 2009).

Strategic management : Strategic management is a collection of government management actions that address the public sector's macro and planned objectives (Adu & Ngulube, 2016). Long-term success of e-government may be ensured by developing strategic plans and guaranteeing their successful execution. Administrators can move towards the realization of a sustainable e-government by adopting the organizational structure (Whitehead, 2017), strategy, and appropriate perspective to e-government services (Altameem, Zairi, & Alshawi, 2006), and change management in the context of sustainability considerations (Altameem et al., 2006; Sorn-In et al., 2015; Kuhbanani et al., 2021).

Detailed Assimilation Process : E-government maturity models should be able to offer a clear explanation of the processes needed to complete the various phases of e-government adoption. When starting a stage, a lack of detailed processes might cause uncertainty because there is no explanation of how each step will be completed (Shareef et al., 2011). Existing maturity models did not include the actions needed to reach the e-government assimilation maturity stages (Shahkooh et al., 2008).

Streamlined Services : For e-government to be viable, government services must be more citizen-centric and simplified (Napitupulu & Sensuse, 2014). Users are discouraged from using given services because of disparate e-government systems and individual databases, which result in partial service and may necessitate additional activity, such as visiting government offices to complete service requests (Rana et al., 2015). Individual and fragmented electronic government systems are also becoming less financially viable for developing nations, as their upkeep necessitates large resources and duplicates government activities (Rowle, 2011). Government personnel must process service requests manually unless these systems are centralized or networked, resulting in inefficiency and poor productivity (Curry & Donnellan, 2012).

State-of-The-Art Technology : To keep up with the latest technological advances, technological models and frameworks must be updated on a regular basis (Supriyanto & Mustofa, 2016). To ensure and maintain competitiveness, technological projects (e.g., e-governments) must use cutting-edge technology (Almarabeh & AbuAli, 2010). Because most maturity models were created several years ago, they lack a strategy for making e-government initiatives more efficient through the use of new technologies (Lee, 2010). Joshi and Islam (2018) noted that the usage of cloud computing platforms for e-government services have to be stressed because old technologies are growing more expensive to maintain and operate, as well as more complex, the researchers believe that when it comes to expanding e-government services in developing nations, governments should use more sophisticated and latest technology.

Agile Accessibility: The success of e-government services is strongly intertwined to their accessibility. Agile accessibility ensures that the services supplied are accessible to the greatest possible variety of individuals, regardless of their ability. While developing nations face a significant difficulty in terms of bridging the digital divide among residents, governments must ensure that all individuals have equitable access to e-government services (Joshi, 2018). Riggins and Dewan (2005) discovered that in developing nations, certain groups of individuals, such as the disabled, the elderly, and the impoverished, are trailing behind in receiving advantages from e-government services. Poor-income persons, those with minimal educational credentials or a low literacy level, the jobless, the elderly, people living in distant or rural locations, people with disabilities, women, and girls are among them (Cullen, 2001). They are also unable to use e-government services because of a lack of access to computers and the internet

Awareness and Trust among Citizens: The adoption of e-government is seen to be aided by citizens' trust (Warkentin et al., 2002). In underdeveloped nations, a lack of information about the benefits of e-governments continues to be a major barrier to user adoption. A lack of user awareness may be attributed to a variety of variables, including education, race, and culture (Shareef et al., 2011). It was also shown that some segments of society (women, persons from lower castes, and those living in poverty) had much lower knowledge of e-governments. Meanwhile, Hollenstein (2004) emphasized the need of establishing public confidence in e-government services for e-government success. Users must have confidence in the legality and authenticity of e-government services, as well as the security and confidentiality of personal

information handled online. As a result, in order to boost user involvement and make e-government services accessible to isolated groups of society, governments should seek to raise user knowledge and ability.

Cultural management: The public sector's ambitions and achievements are heavily influenced by culture (Nam, 2018). Showing values, beliefs, and working together to establish e-government is one of the cultures in e-government (Schein, 2010). Not only does e-government deployment necessitate cultural considerations, but creatives sustainability initiatives which rely on leaders' commitment to cultivating a sustainable culture (Denning, 2011). Cultural management may be a source of institutionalization of support values for sustainable e-government, as can be done through institutionalized programming, shifting the orientation of culture towards sustainable values (Schein, 2010).

E-citizenship readiness: Government entities wishing to develop long-term e-government should concentrate their efforts on citizens. This is the most important aspect in e-government adoption (Beynon-Davies, 2007). The more is people's electronic preparedness, the more it is likely to implement successful and long-term e-government. The goal of this factor is for citizens or working groups to be able to join users and users of information and communication technology. That is, it enable to use information and communication technology effectively and to have citizens ready to use network-based opportunities, particularly the Internet, and to transform traditional methods into new ways (Joshi & Islam, 2018). Citizens' e-readiness is defined by e-empowerment, electronic acceptability, and citizen information technology literacy (Schlger & Stepan, 2017).

2.10.Conceptual Framework

The conceptual framework (Figure 2.2) aims to map e-government maturity to a sustainable e-government service and show the relationship between them by critically exploring the determinants of matured e-government services and the enablers of sustainable e-government services. The conceptual framework is designed based on reviews made on the different scholars that identified different factors of maturity and sustainability of e-government in Sections 2.7 and 2.9.

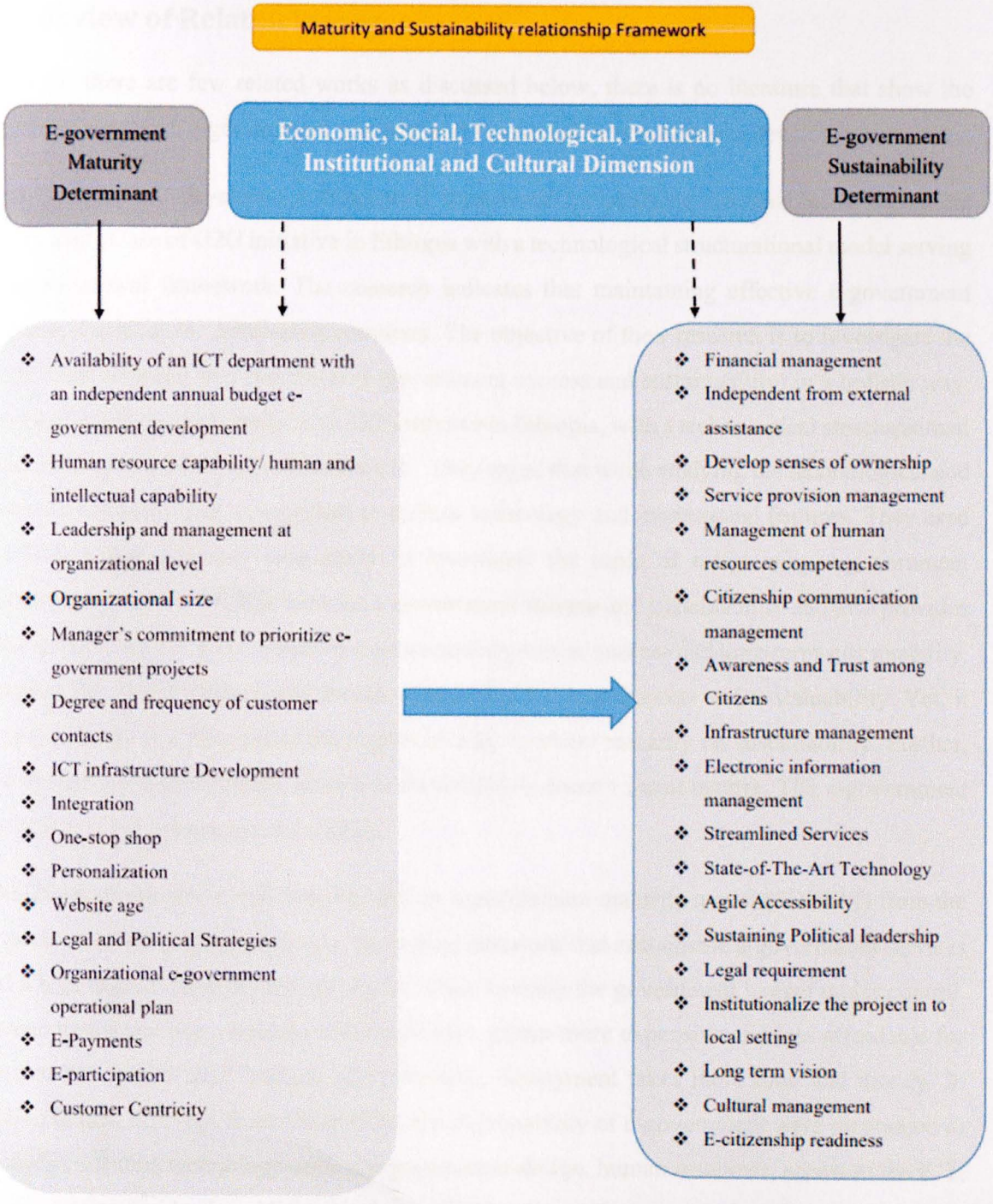


Figure 2. 2.Conceptual framework

2.11.Review of Related Works

Although there are few related works as discussed below, there is no literature that show the relationship between e-government maturity and sustainability conducted in developing countries.

Lessa et al. (2015) developed a conceptual framework for pledging sustainable e-government success in the Case of G2G initiative in Ethiopia with a technological structurational model serving as the theoretical framework. The research indicates that maintaining effective e-government programs is critical for developing countries. The objective of their research is to investigate the possible link between two constructs (e-government success and sustainability) in a holistic way. The research offers a case study of a G2G initiative in Ethiopia, with a technological structurational model serving as the theoretical framework. They argue that while studying the technological and organizational formation, it is critical to include technology and institutional features. They used an interpretive exploratory case study to investigate the topic of maintaining e-government programs and the possible link between e-government success and sustainability and also provides a conceptual framework for analyzing e-government projects' success and long-term sustainability. However, this study focuses only on the relationship between success and sustainability. Yet, it doesn't consider and investigate the impact of e-government maturity on sustainability. Further, even though the e-government service is successful, it doesn't mean mature. The e-government service that is not mature can not sustain.

Joshi (2018) developed a sustainability-driven e-government maturity model (SDEGM) from the perspectives of developing countries. The author described that sustainable e-government services need a high degree of agility and flexibility while keeping the government budget under control. Because traditional e-government initiatives have grown more expensive and less affordable for governments with limited budgets and resources, deployment takes more time and money. In addition to this, different factors that affect the sustainability of e-government were mentioned in this study including technology-centric e-government design, human resources, access to the ICT, and the digital divide. In addition to these considerations, the research has highlighted the e-government maturity model as a key contributor to e-government project failure. The author indicated that in most studies, the development of the e-government projects in developing countries does not align with the stages defined by the existing e-government maturity models.

According to the researcher, e-government maturity models are important in developing long-term e-government services, since they give a strategic framework for implementing e-government initiatives.The researcher examined current maturity models for their influence and contribution to the long-term sustainability of e-government programs, making many discoveries based on lack of detailed activities, technology-centric nature, emphasis on implementation, and lack of adoption perspective.

The author suggested a few criteria that must be integrated into the sustainability-driven e-government maturity model (SDEGM) to help governments in delivering sustainable e-government services based on the constraints of existing e-government maturity models. However, the author didn't examine the determinants of e-government maturity and didn't show the link between maturity and sustainability.

Related research show that no research has been done so far on the impact of maturity on long-term sustainability. Thus, related work focuses on the success and sustainability of e-government. Still, which aspects of maturity in organizations are closely related to sustainability is the gap for research (Klischwskil, & Lessa, 2013).

Table 2. 4. Review of Related Works

	Objective of the study	Methodology & Technique	Key Findings	Observed gaps
)wards a)nceptual 'amework for edging ıstainable e-)vernment ıccess The ase of G2G in :hiopia (Lessa al.2015)	To investigate the relationship between e-government success and sustainability	Qualitative approach. Exploratory case	The research presents a conceptual framework for analyzing e-government programs' success and long-term sustainability.	This study only focuses on the relationship between success and sustainability. It doesn't assess the impact of matured e-government service on sustainable e-government even though maturity is one of the critical factors for the sustainability of e-government service.
Sustainability-riven E- overnment laturity Model SDEGM) From he Perspectives)f Developing 'ountries loshi,2018)	To develop a sustainability-driven e-government maturity model (SDEGM) from the viewpoint of developing countries.	Both qualitative and quantitative approach is used.(Mixed method) Empirical research, Case studies, expert opinions, and survey methodologies are all part of the triangulation	-Identifying 5 determinants e-government sustanability i.e. detailed assimilation process, use of state-of-the-art technology, streamlined services, agile accessibility, and trust and awareness. -Developing a sustainability-driven e-government maturity model (SDEGM) that supports to design and delivery of sustainable e-government services for developing countries. -proposing cloud computing platform for the integration and implementation of the e-movement services in the context of the developing countries	The authors develop a sustainability-driven e-government maturity model (SDEGM). Does not indicate the relationship between maturity and sustainability.

2.12.Chapter Summary

The chapter mainly focused on reviewing literature which are related to maturity and sutanablity of e-government in developing countries. Following a presentation on introductory concepts related to e-government, a more detailed presentation and synthesis is done on e-Government Maturity, e-government sustainability and their determinants. Based on the identified diterminantts of e-government maturity, a conceptual framework has been developed. Then, a review of related works is also presented. The next chapter deals with the research design and methodology.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

3.1. Introduction

This chapter presents the design and methods used in the study. The chapter begins with a brief description of research design and methodology, followed by a discussion of the rationale for selecting the approach employed in the study. The chapter discusses different types of research approaches as well as the contexts in which they might be employed. The data collection and methods of analysis have been briefly presented. The validity and reliability of the data gathering instruments are all discussed in this chapter. The techniques used to answer the research question and achieve the study objective are also covered.

3.2. Design and Methods

The research design and methodology are parts of the research that explain how the final research result is obtained by the study's objective (Sileyew, 2019). A research design is a plan to answer the research question, whereas a research method is a strategy used to implement the plan. As stated by Goundar (2012), research methodology is the technique by which researchers go about describing, explaining, and forecasting occurrences in their research. Research design and methods are different but closely related concepts. Good research design ensures that the data obtained in the research helps to answer the research question more effectively. Approaches and procedures that are used in the entire research undertaking, starting from designing the research strategy to the dissemination of the findings, are discussed below.

3.2.1. Research Design

A research design is essentially a study's structure or plan that serves as a guide for gathering and interpreting data (Pandey, 2015). It is the strategy that guides the researcher through the process of gathering, evaluating, and interpreting data and information (Osuagwu, 2020). It is also a plan to answer the research questions. This plan includes an outline of how the research is going to be structured and undertaken, as well as describing the general plan for collecting, analyzing, and evaluating data. The research design in this study follows the following steps.

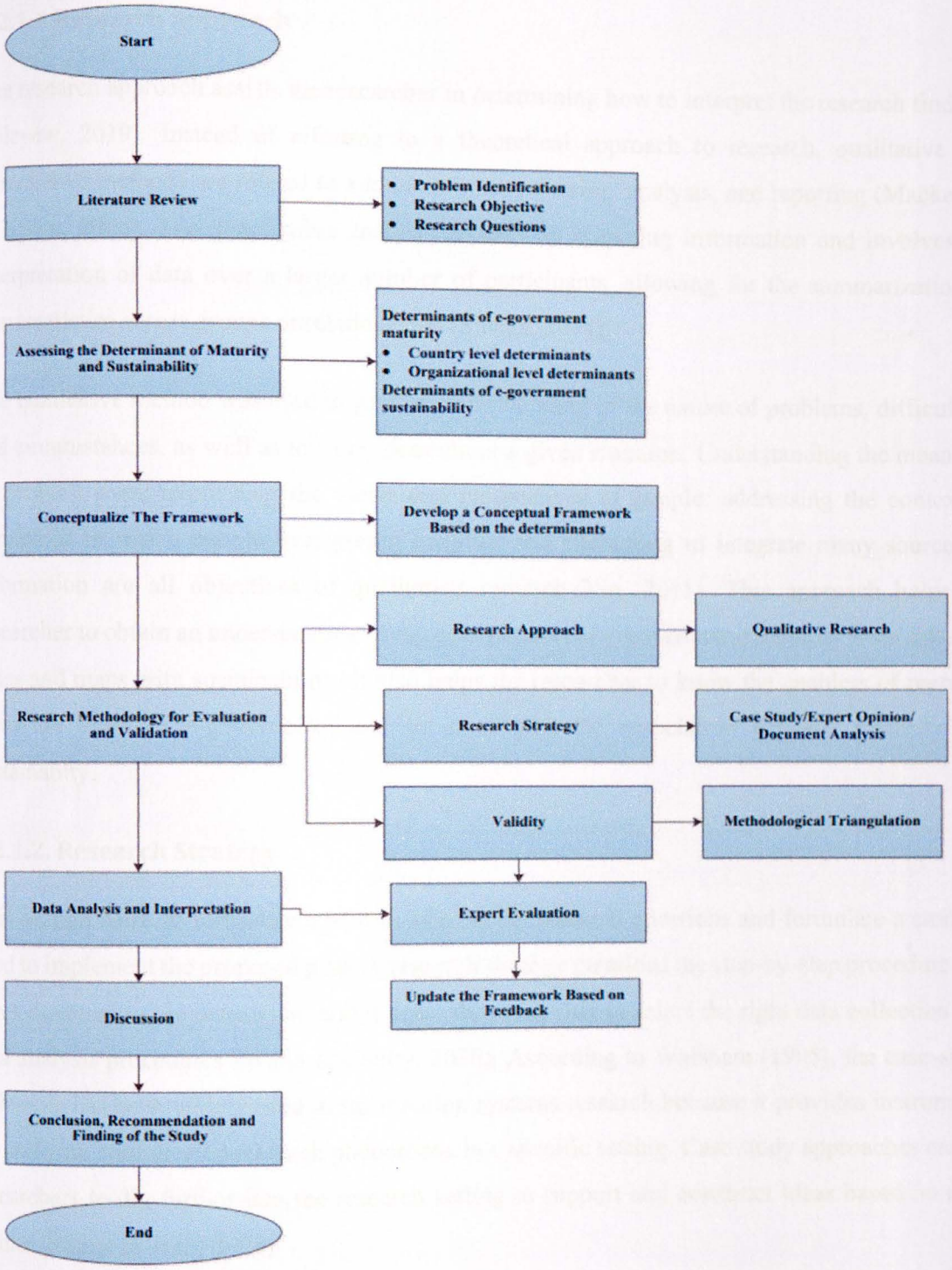


Figure 3. 1. Study Structure

3.2.1.1.Research Approach

The research approach assists the researcher in determining how to interpret the research findings (Sileyew, 2019). Instead of referring to a theoretical approach to research, qualitative and quantitative methods are related to a mode of data gathering, analysis, and reporting (Mackenzie & Knipe, 2006). The quantitative analysis focuses on obtaining information and involves the interpretation of data over a larger number of participants, allowing for the summarization of characteristics across groups or relationships (Sinaga, 2014).

The qualitative method was used to gain an understanding of the nature of problems, difficulties, and circumstances, as well as to form ideas about a given situation. Understanding the meanings of people's lives; expressing the views and perspectives of people; addressing the contextual conditions in which people live; giving insights; and attempting to integrate many sources of information are all objectives of qualitative research (Yin, 2011). This approach helps the researcher to obtain an understanding of the determinants of e-government maturity from different cases and maps with sustainability. It also helps the researcher to know the enablers of maturity from the users of e-government and to investigate the association between maturity and sustainablty.

3.2.1.2. Research Strategy

This section helps to formulate a plan to address the research questions and formulate a strategy used to implement the proposed plan. A research strategy mentions the step-by-step procedure that gives direction to the researcher, and it helps the researcher to select the right data collection and data analysis procedures (Walia & Chetty, 2020). According to Walsham (1995), the case-study technique has been widely used in information systems research because it provides instruments for studying complicated research phenomena in a specific setting. Case study approaches enable researchers to dig further into the research setting to support and construct ideas based on their results (Baxter & Jack, 2008).

A case study answers the questions of how, why, what, and which is used to explore a phenomenon in context using one or more data collection methods. It describes a case or cases in-depth. An exploratory case study intends to answer the question of how and what is used when there is more

than one outcome. It is undertaken to explore an area where little is known or to investigate the possibilities of undertaking a particular research study (feasibility study/pilot study) (Goundr, 2012).

An exploratory case study is used as a research strategy because this research tries to investigate the determinants of maturity and sustainability that are not clearly defined in the previous literature and need further description. In addition, the research intends to identify which aspects of maturity in organizations are closely related to sustainability and show their interaction by developing a conceptual framework. Thus, exploratory research design was employed to obtain a deeper understanding of this unknown concept, to demonstrate that it exists in meaningful ways, and to investigate related difficulties.

The conceptual framework is evaluated through a real e-government project in Ethiopia by following an empirical investigation that adopts methodological triangulation. Since sustainability has been defined from different perspectives of maturity, the methodology which was employed to evaluate each dimension also differs. The triangulation includes a case study, expert opinion, and document analysis as shown in Figure 3.2. The interaction dimension of the conceptual framework has been evaluated by adopting the case-study method that verifies whether the determinants of maturity correctly map to the sustainability of the conceptual framework. Similarly, document analysis has been adopted to evaluate the conceptual framework from literature by identifying all the determinants. Finally, expert opinion was used to generalize the findings and validate the framework. According to the research findings, the proposed conceptual framework can demonstrate the relationship between the maturity and sustainability of e-government services.

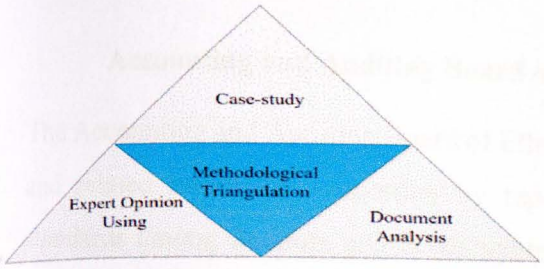


Figure 3. 2. Methodological triangulation for evaluation(Source:Joshi,2018)

3.2.1.3.Study Setting

For this study, four e-government services were selected from the e-government portal of Ethiopia, which is considered to be appropriate for the issue under investigation. From many of the e-government services that are found in Ethiopia, the researcher is interested in selecting the e-government portal due to the possibility of getting many services in one portal and easily selecting two of the cases that have been used for a long time sustainable. The other two cases are not active on the portal. Moreover, all the services are controlled by one government institute called the Ministry of Innovation and Technology (MinT), which makes the study process easy. In general, on the e-government portal of Ethiopia, there are 23 service providers and 222 e-government services. In this study, the cases were selected based on the service providers. The Ethiopian Construction Authority and Accounting and Auditing Board of Ethiopia have been sustainable since 2017. On the other hand, the Federal Attorney General and the Basins Development Authority are taken for those which are not sustainable .

Ethiopian Construction Authority

The Construction Work Regulatory Authority was established to support the construction industry's infrastructure expansion missions, which are critical to the country's social and economic development. It must be capable of forming strong bonds with the production and service sectors, as well as being competitive in the global market. They decided to use the e-service to improve performance and accomplish their goals by delivering quality service. They started using the e-service in 2017. In general, they have 22 services on the e-government portal of Ethiopia.

Accounting and Auditing Board of Ethiopia

The Accounting and Auditing Board of Ethiopia was established to promote high quality financial and related information reporting by reporting entities, to promote the highest professional standards among auditors and accountants, to promote the quality of accounting and auditing services, to protect accountants and auditors' professional independence; and so on. They want to use the e-service to increase performance and achieve their objectives by providing high-quality service. In 2017, they began utilizing the e-service on Ethiopia's e-government platform. They offer 4 services in total.

Federal Attorney General

The Federal Attorney General currently, which is called the Ministry of Justice, is in charge of ensuring that justice is effective, efficient, accessible, and predictable. The Attorney General prioritizes efforts aimed at preventing threats to the constitution, constitutional order, and public interest, as well as prosecuting offenders. It also undertakes legal research and studies, as well as raises community awareness about human rights protection, strengthening the rule of law, and promoting good governance and development. Furthermore, the Attorney General is working to build a system that ensures advocates' professional competence and rules of conduct in order to enhance their position in the legal system, as well as make the registration system complete and proactive. The organization decided to deliver services by e-service through the e-government portal of Ethiopia at the time of COVID-19 to reduce personal contact. They had 6 services on the portal. They started to deliver service in 2019 and existed only for 5–6 months.

Basins Development Authority

The Authority was established with the goal of implementing equitable and participative sustainable and integrated development, management, and exploitation of water resources at the basin level.They began providing service via e-service by hosting 6 in 2017, but they did not last long, and by the time of COVID 19 in 2019, they had begun for the second time to reduce physical interaction. However, due to some obstacles they face, they can only stay for around 5–6 months.

3.2.1.4.Case Selection and Study Participants

Sampling is a method of selecting individuals or a subset of the population in order to estimate population characteristics. Purposive sampling is a type of sampling, which was employed to select members of samples according to the purpose of the study. It is also called judgmental or deliberate sampling (Bhardwaj, 2019). To identify the data sources of this research, purposive sampling technique was used for the case organization. Thus, to collect the primary data, appropriate and convenient samples were selected who have direct participation and involvement in the selected e-government services.

For this sampling method, key respondents were selected intentionally as information resources for the sake of the research questions to be properly answered. This study requires participants to be involved in e-government services or to have knowledge and experience with e-government services. The key respondents of the case organizations include 10 respondents, who are: 3 system users (case workers), 2 IT teams, 2 IT directors, and 3 top managers. In addition to the case organization, 3 respondants were interviewed from the developers' side: 1 project manager and 1 project coordinator from MinT, and 1 consultant team member to get further information. Generally, 13 respondents participated at the time of data collection. There is no hard and fast rule for the number of respondents in qualitative research.However, Clarke and Braun (2013) have been advised that a minimum sample size of 12 is required to achieve data saturation in qualitative investigations. In this study, the respondents are experienced and rich in the area. Considering more than 13 respondents probably makes the data repetitive. So, the researcher collected all the information at this stage.

3.3.Research Techniques

This section helps the researcher to collect data and find a solution for a research problem. To collect primary data, a semi-structured interviews techniques were used.

3.3.1.Data collection

This section is concerned with the collection of data to make it available for analysis. Based on the appropriate sample selection, primary data was collected from the employees and users of the

selected e-government services by identifying key individuals who have been involved in the E-government portal.

- Interviews were conducted in order to obtain a broad picture of activities as well as technical information concerning the relationship between maturity and sustainability on the basis of their determinant. The interview also assists in the understanding and analysis of non-verbal communication, such as gestures or body movement, as well as the respondents' voice intonation. The interview was unstructured to allow respondents to openly speak and share their views and professions while still being semi-structured to focus on the most important facts concerning the determinants of both maturity and sustainability. Interviews allow respondents to bring up concerns that the interviewer may not have anticipated (Sileyew, 2019). Follow-up questions were asked based on the respondents' prior responses in order to have a more in-depth look at the factors that affect maturity, sustainability, and the reason why maturity relates to the sustainability of e-government services .

- Secondary data was collected through document analysis like organizational policy strategy and literature review to better understand the determinants of maturity and sustainability and their assosation.

3.3.2.Data Analysis

Data analysis is the process of creating interpretations of raw data to provide useful information or outcomes. In this study, the collected data through interviews and secondary data through document reviews were interpreted using thematic analysis.

Thematic analysis is a powerful yet flexible method for analyzing qualitative data that can be used within a variety of paradigmatic or epistemological orientations. Thematic analysis is an appropriate method of analysis for seeking to understand experiences, thoughts, or behaviors across a data set. Themes are actively constructed patterns (or meanings) derived from a data set that answer a research question, as opposed to mere summaries or categorizations of codes. Themes can be generated inductively or deductively. " Kiger & Varpio (2020)

As stated by Kiger & Varpio (2020), the most commonly used methodology for doing thematic analysis is a six-step procedure that includes familiarizing oneself with the data, generating initial codes, looking for themes, reviewing themes, defining and labeling themes, and publishing the report. Because of the versatility of theme analysis, researchers who use it must explicitly describe their paradigmatic orientations and assumptions to guarantee that their findings and interpretations are reliable.

Step 1: **Familiarizing yourself with the data**

The first stage in the thematic analysis method is to familiarize yourself with the complete data collection, which includes reading it over and over again (Braun and Clarke 2006). The researcher read the interview transcripts, observation notes, and the reviewed documents thoroughly to familiarize and comprehend the body of the obtained material and made notes on the initial thoughts.

Step 2: **Generating initial codes**

To reduce large amounts of data to little pieces of significance, the researcher coded and arranged important pieces of data in a meaningful way. A code is the simplest piece, or element, of raw data or information that may be evaluated in a meaningful way about the phenomenon.

Step 3: **Searching for themes**

The researcher created themes by examining, combining, and comparing how codes interact with one another by deciding which codes are the most relevant, and organizing them into broader themes that are relevant to a research question.

Step **4: Reviewing themes**

It is a two-level analytical process. At the first level of analysis, the researcher looks at coded data provided inside each theme to guarantee the adequate fit of each coded data placed within each theme in step 3, and also a similar set of questions is applied to the topics regarding the complete data set at level two. Individual themes must fit meaningfully within the data collection, and the thematic map must properly and sufficiently reflect the complete body of data.

Step 5: Defining and naming themes

Following the refinement of the thematic map in step 4, the researcher creates a definition and narrative explanation of each topic, as well as why it is essential to the overall study question. The titles of the themes that were included in the final report were checked to verify that they were concise and informative enough.

The researcher then focuses on the most important aspect of each theme and which aspects of the data set it covers, creating a coherent narrative of how and why the coded data within each theme provides unique insights, contributes to the overall understanding of larger questions, and interacts with other themes, creating a coherent narrative of how and why the coded data within each theme provides unique insights, contributes to the overall understanding of larger questions, and interacts with other themes. While answering these questions, the researcher searches for areas of overlap between themes, discovers emergent sub-themes (which may be used to offer more thorough explanations of themes as well as to characterize hierarchies within the data), and explicitly defines the scope of each topic.

Step 6: **Producing the report/manuscript**

The final step in the research process is to write a report. This step included describing the categories and how they are related, as well as writing down the researcher's opinions and discussing the findings.

3.4.Validity and Reliability

This section presents the validity and reliability of the data. The terms reliability and validity are used to assess the quality of research. They indicate how well a method, technique, or test measure something. Reliability is about the consistency of measure, and validity is the accuracy of an instrument. Yet there's a possibility of researcher subjectivity while gathering qualitative data. Validity and reliability are difficult concerns in qualitative research (Lessa, 2015).

Valid research is the one that has properly collected and interpreted data. So that the conclusions accurately reflect the real world that was studied. The validity of a measure reflects the extent to which the measurement process is free from error. For a measure to be valid, it must be reliable.

"Validity in qualitative research means the extent to which the data is plausible, credible and trustworthy; and thus, can be defended when challenged." Bashir, et al (2008).

However, to conduct meaningful research, the researcher has taken into account different users and various data gathering methods. The obtained data were adequately recorded to ensure data trustworthiness. The interview responses were transcribed and sent to the respondents via telegram for confirmation, in order to obtain legitimate, genuine, and convincing findings. This assists the researcher in ensuring accuracy and reducing subjectivity and bias.

Reliability is the degree to which the research method produces stable and consistent results and also whether the measurement is free from random error (Taherdoost, 2016). Reliability is considered to be the consistency and predictability of the research findings.

The findings of this research should be applicable to similar cases in other organizations and/or other countries. Similarlly, it is also expected to be applicable to other information systems applications that should have to be mature and sustained for a long time. Generally, the findings of the research should be repeatable for all e-government services or the research has to obtain the same or related results each time on the same or similar subject.

3.5.Chapter Summary

In this chapter, the research strategy and methodologies for addressing the research objectives have been explained. The research approach, sampling method, data collection methods, the data sources, and data analysis processes have been presented. This chapter outlined all of the study methodologies which the researcher planned to implement. Since the purpose of this study is to suggest a framework which shows the associations between maturity and sustainability by identifying their determinants, a qualitative approach to research has been employed. A case study has been used as a research strategy. For the selection of relevant respondents, purposive sampling has been employed. As a qualitative approach, interviews, survey method, and document inspection were employed to collect relevant data for the study. Thematic analysis has been used to analyze the collected data. The chapter also covers the design, construction, and validation processes for the methodology. Finally, the chapter addresses how research reliability and validity were maintained in order to eliminate biases in the research.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1. Introduction

This section presents the data obtained from interviews conducted with the case organizations in Ethiopia: Ethiopian Construction Authority, Accounting and Auditing Board of Ethiopia, Federal Attorney General, which is currently called the Ministry of Justice, and Basin Authority, which at this time has merged with the construction authority. In addition to this, the researchers included the Ministry of Innovation and Technology and Perago Information System PLC because of the reason that they developed and implemented the e-services for the organizations mentioned above.

4.2. Respondents' Information

The study participants in this research were two IT directors, two IT teams, three case workers on e-services, and three top managers. Moreover, from the developer side, one project manager, one project coordinator, and one consultant from each of the case organizations involved in the e-service implementation were designated. In all cases, face-to-face interviews were carried out for data gathering..

4.3. Challenges during Data Collection Process

In the course of time, several personal visits and phone calls were made to arrange a convenient interview time with the respondents. Besides, there were different challenges on the side of the respondents. Obtaining data was not an easy task, especially data related to sensitive issues such as maturity and sustainability of e-services in government organizations for security reasons. Eventually, the researcher created a good rapport with the participants and managed to convince the respondents. When the researcher needed clarification on some concepts, a phone call was used. Finally, the transcribed interview data was sent to the interviewees through telegram, and more than 70% of the respondents approved it as correct; the rest didn't respond due to being busy.

4.4. Data Presentation

Interview Data

The interviewees were the system users (case workers), top managers, IT teams, IT director, project manager, project coordinator, and consultant. The concepts of the interview questions were drawn from the conceptual framework and incorporate six categories: economic, social, technological, political, institutional, and cultural dimensions of maturity; and sustainability of e-service as discussed in the literature review section. Accordingly, different components are associated with those e-service dimensions.

4.4.1.Economic

Respondents were presented with interview questions which sought their explanation of the impact of financial management, external assistance in terms of finance, human resources, and availability of an ICT department with an independent annual budget on the maturity and sustainability of e-government service.

- **Financial management**

Interviewee C mentioned that the government provided the required budget for the development of e-services to MinT, and then, MinT and Perago entered in to an agreement to establish e-services which could help government institutions to be able to utilize for free. In addition, **Interviewee** A.The service is developed by the government and the institutions that use it are not charged with any fee. Despite the fact that organizations do not allocate budget specifically for the development of e-services, all organizations have well-organized financial management in order to achieve their organizational goal and create an easy payment system. Some organizations allocate better budget for the development of the technology.

"Because of the budget they allocate, some organizations have strong infrastructure such as computers, networks, high bandwidth connections, tablets, and wireless devices. Even when they travel to the field, they can access the e-service. E-service will have a higher chance of growing in such institutions and exist for a long time" … **Interviewee** C

- **Availability of an ICT department with an independent annual budget for e-government development**

Interviewee A mentioned that each organization has its own ICT department with its own budget. However, most organizations' ICT department is organized as a support team not as a core business process. Due to that, the budget is very small. It is not enough to develop a system such as the e-government. According to **Interviewee** B explained that there is an organized IT team in some organizations, but not in the other organizations.

"If the ICT department is independent and organized as a core business in each institution, its e-service can grow. Because if it has strong ICT department in terms of budget and skills, it can use state of the art technology for the infrastructure and network, high band width internet capacity and also possesses skilled (knowledgeable) team members." **Interviewee** B

Interviewee G said I think that the lack of a strong ICT department and a responsible body has hindered the service's ability to mature farther.

"We do not have a well-organized and well-trained IT Directorate as an organization, but we do have a support staff with a small number of professionals. I believe that if the consultant completes on time, the service's sustainability may be endangered." **Interviewee** G

The ICT department is structured as a team and lacks enough budget. As stated by **Interviewee** I because there aren't enough specialists in the team, they usually do support work like maintenance, which limits their ability both monetarily and knowledge wise to own and manage the e-service.They normally contact the consultant to settle any issues they have with the service. An organized ICT department is essential to meet this duty.

- **Independent from external assistance**

According to Interviewee H, working with a consultant to develop an e-service has a positive impact but it takes a long time. However, to develop it by ourselves, we don't have the necessary knowledge and experience. When we work with a consultant, the professionals in the institution gain valuable experience in the process. Accordingly, **Interviewee** L explained that external assistance is necessary to our organization because it is difficult to develop e-service by our

professionals. However, they have to own the e-service and manage it after implementation by transferring knowledge from the consultants.

"I think if we had external assistance to implement e-service, it would be better in terms of budget and knowledge transfer, because in most of the government institutions there are no qualified ICT professionals, there is no knowledge to develop e-service and the budget allocated to the department is also very little so it can be difficult to develop. It is also important to enable the staff in the institute to manage the e-service on their own, as it may not be sustainable" .**Interviewee** B

All of the interviewees agreed that, this issue affects the sustainability of e-services.

4.4.2 Social

Respondents were presented with interview questions which sought their explanation about the impact of social factors that determine the e-government maturity and how it affects the sustainability of e-government in terms of human capital, leadership, and management, Manager's commitment, Degree and frequency of customer contacts, etc.

- **Human resource capability/human and intellectual capability**

Interviewee A- Human resource capability is critical for the service's growth since educated individuals can readily understand it. However, older professionals may find it difficult to interact with the service because they don't understand new technology and may be hesitant to continue working in the service. For these reasons, they want to continue with the existing service delivery or manual approach. According to **Interviewee** C, the services provider/case worker's IT skills at different times may vary according to the experts, which may depend on age and level of education in terms of understanding the service. Although some experts are trained frequently, they may not easily understand the service.

"I think the human literacy level has a huge impact on the maturity and sustainability of the service because even in one institution a well-educated workforce can understand and continue the service, while in low-skilled departments, the service goes back to manual without understanding. This makes the e-service not fully functional. **"Interviewee** A

Interviewee G- Experts who work in e-services are all educated with at least a bachelor's degree and have no difficulty understanding the service and providing services. Sometimes one expert

shares his/her knowledge and experience with the other experts, which makes it easy to understand and work together. Even when facing challenges greater than our capacity, we ask for support from consultants. For this reason, the service delivery mechanisms grew.

"The fact that many professionals are educated and can easily comprehend and utilize the e-service, is one of the reasons for its long-term sustainability, and the major one is the leader's high degree of engagement. This is due to the fact that this institution's e-service was launched during the Covid 19 outbreak; hence, they were required to do so in order to reduce client contact." **Interviewee** H

Most of the respondents mentioned that, this issue affects the maturity and sustainability of e-service.

- **Staff Retention**

Interviewee A- In most organizations, IT experts do not have enough knowledge in this area. For such reasons, continuous training must be given. However, in some cases, the trainees who are selected for the training by the institution do not work in the right place, and the trained ones do not work after the training either. This happens because of high staff turnover.

"Staff turnover has a substantial influence on e-service maturity because it puts a load on other experts, causing them to get focused with daily tasks rather than trying to enhance the service." **... Interviewee** M

On the other hand, **Interviewee G** mentioned that the staff who are hired in the organization do not leave us often, and the professionals who are working on the e-service are constantly gaining experience, which has contributed to the growth of the service and has made the service delivery more mature and sustainable.

- **Manager's commitment to prioritize e-government projects**

Interviewee H-mentioned that the existence of a manager's dedication in our organization helps us to rapidly address issues. However, **interviewee** K-states that he doesn't feel that managers are extremely dedicated because the majority of them have limited experience in the area and are just forced to do things by regulation.

Interviewee G-I have doubt on managers' commitment to use e-service by giving priority than other projects because they don't understand the benefit and also, they don't have knowledge. I need a leader who has to know the service more than or equal to experts. There are things to be started but no one is committed to implement it. Rather **Interviewee** L- mentioned that the key reason for our success, in my opinion, is that each employee in our company has made a personal commitment to accomplish our job using e-services. To this end, our ICT department has taken the lead in making the e-services sustainable.

"*I think individual commitment has a very high contribution to mature and sustain the e-service because some of the professionals we have helped to keep the system so far have been committed to supporting it and being able to take responsibility for fixing it when it is broken. Every professional commitment, even if there are problems, can withstand that and grow the service.*" **.... Interviewee C**

- **Management of human resources competencies**

As stated by **Interviewee H**, the people in their organization did not receive regular training. However, after the implementation, it was given to all the professionals at once. I think this is enough, but according to **Interviewee E**, case worker misunderstanding of the training that was given to them resulted in difficulty translating into practice. Some experts are not active in accepting the technology because inadequate training was granted to them. However, **Interviewee A** mentioned that some organizations have regular rotations of staff, which happens due to the nature of their work. Working in the same position by rotation always enables the organization to provide on-the-job training to its staff by its own professionals. Because this creates an opportunity for the untrained staff to be trained by their own staff.

"*Training is always provided before the lunching of implementation of the system. The training is also provided to the newcomers when the previous employee was released. The training will be given if required by the institute or when necessary, based on assessment, yet request for taking the training from the trainees themselves that was more fruitful than other means.*"

Interviewee G explained that the expert does not receive a salary increment or special reward for working on the e-service after training. He or she will only benefit from using the service as it will reduce the previous workload and therefore, will not be willing to work under the manual system.

Most of the respondents mentioned that, this issue has an impact on the maturity and sustainability of e-service because when the experts are properly trained, they can easily do their work by using e-service.

- **Degree and frequency of customer contacts**

According to **Interviewee B,** companies with high customer contacts have more mature e-services because such companies have a high work load. Due to that, it is better to use e-service than the manual system.Additionally, **Interviewee** C said that customer contact has an impact on e-service maturity. I think it varies according to the capacity of the organizations. Since they have high customer demand, they will try to improve their infrastructure and bandwidth to give quality service to citizens. Also, **Interviewee** M mentioned that "*The system will go down or fail if the frequency of customer contact is too high." This is because the infrastructure does not have the ability to handle a large number of clients*. This will indicate that we should upgrade the system. In contrast to this **interviewee,** G mentioned: "*With over 100,000 customers, we are able to provide a more involved and long-term service.*"

- **Awareness and Trust among Citizens**

According to **Interviewee** A, the level of public awareness creation is insufficient, but she is familiar with the experience of creating advertisements on television in the past, which she believes hinders the service's growth. Additionally, **Interviewee** B said that they try to create awareness by doing different promotions on different media, such as TV and ICT expo; but it is not enough. **Interviewee** G and **Interviewee** H also use a variety of methods to raise awareness, such as printing booklets, bulletins, billboards, digital signage, YouTube, and we believe that they are fully aware of this. They put advertisements on the organization's notice board and television advertisements, and they believe that everyone is aware that they should apply for the e-service before going to the organization. But **Interviewee** J said that even though there have been attempts to raise They try to raise awareness, but they don't believe they are adequate. This affects the long-term sustainability of our services.

"*Due to the reason that we didn't create awareness on the citizens, we are creating a citizen who does not want to get online service. Because most customers know about the e-service after they*

go to the organizations physically and after they reach there, they want to get the service manually." **Interviewee** C.

- **Customer satisfaction**

According to **Interviewee** G, customers are complaining because the e-service is still not satisfactory. It can only grow if this is addressed; or else, it may be compromised. In addition, **Interviewee** H mentioned that some customers complain about a lack of access to technology, while others complain about network outages, and some customers want to come and go as quickly as possible. **Interviewee J** said that because our client group ranges from grade 4 to PhD, they have not internalized the e-service. As a result, the majority of customers find the e-service difficult to understand and utilize. On the other hand, **Interviewee** D explained that documents that are changed during online renewal will be provided to the customer's email address, and they will print the document on a single sheet of paper in black and white. It is difficult to use, causing the client to be dissatisfied with the service.

"While I didn't have research-based data on customer satisfaction, most customers complain. They find it difficult to register by using the service. Even though procedures are posted everywhere in our offices, they are difficult to understand, so they went to the internet café to apply. " **Interviewee** G

According to the opinion of **Interviewee** B, he thinks that citizens do not have confidence in the e-service because most of the time, people do not seem to be willing to use it on their own initiative unless they are told to go and provide this service. Instead, **Interviewee G** believes that customers have confidence in the system, but on our side, we do not trust e-service because we are sure that the files we save will not be lost unless there is an accident. The system did not have a backup when the system went down. We lost data that had been done for the last month. Yet, **Interviewee** E explained that most of the customers complained that they did not understand the usage and did not receive any documents from the institution.

"*Without a Citizen Request, no matter what service we have, it will not be sustainable.*" **Interviewee** C.

All of the respondents mentioned that customers always have complaints about the service and need to depend on the manual system, which affects the maturity of the service and may result in a total failure.

4.4.3 Technological

Respondents were presented with interview questions which sought their explanation of the impact of technological factors that determine e-government maturity and how they affect the sustainability of e-government in terms of ICT infrastructure development, Website age, Integration, E-Citizenship readiness, E-payment, etc.

- **ICT infrastructure development**

Interviewee A mentioned that when the e-service was launched, it used woreda net. Currently, the number of e-services given has been increased, yet the capacity of the system is very slow. Therefore, institutions have started to use the internet. Using the internet somehow transforms the e-service granting mechanism, but still there is a connection problem. In addition, **Interviewee A** explained that even though the digital dividend in our country has an impact on e-services, the telephone, internet, and non-telephone segments of society can go to the internet café, and this has become a new field for young people. The digital dividend has created a gap, but it is not being used effectively because some people do not have the knowledge, which slows down the e-service. According to **Interviewee A**, infrastructure incompetence can be seen from the host system, and it is difficult to install additional services. Due to the lack of sufficient servers to install services, there is a need to have a backup server. Additionally, due to a lack of internet capacity, the service will be interrupted from time to time. These factors prevent the service from growing at the desired level and can be unsustainable. Institutions do not have their own data center; for this purpose, decentralizing is difficult in terms of cost and management.Most respondents mentioned that infrastructure is currently a major problem and work is underway. To address this, Internet capacity is improving, but it is still lacking.

"One of the issues is infrastructure and service incompatibility. At the national level, there is an infrastructure problem. We do not have a qualified data center. All government institutions are building small data centers in a fragmented manner, which needs to be amended.." ...**Interviewee** L-

Interviewee G mentioned that in their organization, there is no ICT infrastructure problem; all specialists have their own computer/laptop, even if it is not the most recent, and the connection is not with adequate bandwidth.

- **Website age**

According to Interviewee I and **Interviewee** G, the webpage is progressing, new services are constantly being added, and functionality is improving. Professional experience is also increasing and customer acceptance is constantly increasing, which makes the e-service mature and it's going to mature.

Most of the respondents agreed that the more the web page continually grows, the more the e-service gets matured.

- **Integration**

According to **Interviewee A**, due to the lack of integration between services, the process has been difficult and the paperwork has not been fully halted. Due to such a fact, the employee's performance decreases. For this reason, the service can't grow, and if this continues, the sustainability of granting e-service becomes under question. Although **Interviewee C** mentioned there is no integration across institutions, work is done by a single institution. This does not imply the provision of a successful independent service. This is because if you go to one institution that has an e-service and another that does not, the user will experience the same thing as a manual system, and their interest in utilizing it will decline, which halts the development of the e-service. In addition, **Interviewee D** and **Interviewee G** stated that they submit the necessary documents for renewal, but there is no way to verify the authenticity of these documents due to the fact that the service provided by the e-service is not associated with various organizations. There are documents that need to be checked while we are doing the work and the customer has to pay a fee, but the e-service is not integrated with other institutions, which makes our work difficult.

- **E- Citizenship readiness**

As stated by **Interviewee** A, the only institutions that are willing to use the service are those that have checked the e-readiness. **Interviewee H** also explained that before development started, e-

readiness tests were conducted, and criteria such as computer and internet connectivity, as well as tablets, were fulfilled.

"E-readiness of the system were investigated first and foremost. If you know how many people can use a computer, a network, an Internet capacity, and how many people can use the e service, the institution will be given priority because the institution that does not meet these requirements will not be able to continue to get the service." **Interviewee** B

On the other hand, **Interviewee** D explained that the readiness of citizens is not assessed before the implementation of the service. Most of the customers don't have a smart phone, internet, or home computer, and most of our customers can't easily register themselves on the e-service even though they are educated.

Most of the respondents agreed that, this issue affects the sustainability of e-service.

- **E-payment**

Interviewee A explained that due to the lack of integration between institutions and services, the customer mode of payment was not integrated with e-services, so customers pay service fees through their bank. Because of this reason, the service is not matured and if this continues, through time, the sustainability of the granting e-service would be under question.

- **E-participation**

As stated by **Interviewee C**, people can give their comments on the portal and ask any questions that they don't understand when they register on the e-service, but the portal still doesn't include technologies such as comment forms, surveys, e-voting, and e-petitioning.

Most of the respondents agreed on this issue.

4.4.4. Political

Respondents were presented with interview questions which sought their explanation about the impact of Political factors that determine the e-government maturity and how it affects the sustainability of e-government in terms of Political environment , Legal and Political Strategies, Sustaining Political leadership and Strategic management, etc.

- **Political environment**

Interviewee H and **Interviewee** I explained that the political environment has an impact on our e-service maturity. For example, network service would be disconnected in conflict areas. Furthermore, when the political environment changes, so do leadership and policy; this has an impact on e-services in government organizations. In these kinds of areas, the organizations' plans to utilize e-service are interrupted because of the conflict that occurred.

"*Political environment has an impact on the development of services due to the current political crisis in our country. In some places, the Internet was down, and in some cases the network infrastructure was destroyed. As a result, service was disrupted in areas where this problem persisted*" **Interviewee** L.

- **Legal and Political Strategies**

According to **Interviewee B**'s explanation, while political strategies have their own implications, strong and binding rules governing the usage of e-services are critical. I believe that the public and institutions will make greater use of the service. If these tools are correctly implemented, service delivery will be very sustainable, and the general public will feel secure in their data and trust in the government. All respondents acknowledged that this matures the system, but there are no rules, laws, or policies in place in the organization.

- **Sustaining Political leadership**

As stated by **Interviewee** B, political leaders are constantly changed; therefore, the new one is being influenced by a lack of uniform working procedure, because systems change when people are changed. This can cause the service to fail. Subsequently, as political leaders change, persuading the next person to re-enter the service can put the service back on track. Additionally,**Interviewee** C said that political leaders can be changed frequently and this makes the work to start from zero because institution's working processes are determined by the leaders the reason is no permanent system is in place.

"*One of the challenges we face is that the leaders are changed from time to time, as a result, when you talk about what you are doing and the benefits of the system as whole, leaders are changed*

again, when you go to work, all the work goes back and forth. Frequent changes in leadership is one of the things that prevent us from doing our best in the service." **Interviewee** A.

- **Strategic management**

As stated by **Interviewee G,** There is no vision, mission, or strategy in their organization that includes e-services or other technologies. They didn't put it in their strategy since they thought it was a basic tool that they utilize to conduct their work. In contrast to the one that failed, all of the respondents whose organizations have a sustainable e-service indicated that they incorporate e-service and other technology in their vision, goal, and strategy.Besides **Interviewee M** also mentioned that they are working on a technology-based plan for their organization's vision, mission and strategy. One of them is to use the service to do job, and as a result, the service is constantly growing and sustained.

"We plan to integrate technology in our institutional planning operations, therefore, e-service is also included" **Interviewee H.**

4.4.5 Institutional

Respondents were presented with interview questions which sought their explanation about the impact of Institutional factors that determine the e-government maturity and how it affects the sustainability of e-government in terms of Institutional Instability, Long term vision and Organizational size, etc

- **Institutional Instability**

According to **Interviewee** A, institutional Structure of institutes changes frequently. Because of this fact, employees are not ready to perform their job; the reason is they didn't know who is on the position they were exist and also on the same institution. In addition, after we complete to grant training and request experts who participate on training, they do not know which expert will be sent to the training because they fear that the trained professional may not be able to work in the next position. |Further, **Interviewee C** stated institutional instability is one of the factors that affect the maturity of e-service. One of the problems they have with some institutions is that when they customize the service and start working, the institution will collapse, and this makes the organization to be devoid of long term vision on top of that some of the factors that impede them

from achieving their best in the service include frequent institutional changes was mentioned by **Interviewee** A.

"I think the existence of institutional instability will have a big impact on the growth of the e-service because of the instability of the staff during the shift, the shift of expert's position, the replacement of former employees who took trainings with new one, the need to provide new training to new employees. However, when training is planning to grant it is unknown for whom the training be given. Additionally, despite the right professional who are working in the given position might not be sent to the training also one of the challenges for the development of the system. On *the other hand, the newly formed institution is less motivated to use the service."* **Interviewee** B

- **Long term vision**

All interviews explained that, their organizations don't have a long-term vision in relation to e-service; this may affect sustainability of the services.

- **Organizational e-government operational plan**

Amost all respondants mentioned that there is no a clear vision and mission in their organization in related to e-government.However, there is an e-government strategy that guides and supports the whole e-government implementation process and focuses on the achievement of specified and well-articulated e-government goals are existe as a country.

- **Organizational size**

Almost every respondent claims that the size of the organization has no effect on the maturity and long-term sustainability of e-services.

4.4.6 Cultural

Respondents were presented with interview questions which sought their explanation about the impact of Institutional factors that determine the e-government maturity and how it affects the sustainability of e-government in terms of change in culture in organization.

- **Change in Culture**

According to **Interviewee** A, some organizations have a good work ethics, for example, working together during rest time, and this culture has made the service sustainable. **Interviewee** B also mentioned that organizational culture has an impact on the maturity of the e-serves. Due to this reason, organization which has good culture can easily accept the service and use it effectively. Additionally, **Interviewee** C also explained that it is not difficult to launch e-services in organizations with a good working culture. It makes it easier for them to cope with problems and sustain the service. Similarly, **interviewee** G said that they do their job as a team and also have an excellent working culture, which allows them to execute their tasks more efficiently by utilizing the e-service and sharing their knowledge. **Interviewee** L mentioned that during the pick-up time at their institution, employees required to join on their weekend's time and work what is assigned. And they think this is their best experience which can best be shared to others. According to **Interviewee** M, they have a positive work environment and are dedicated to completing their task. The expert also works on weekends to keep the service operational by using the e-service.

"*I believe that e-service may strengthen our organization's work ethics since the task allocated to a person must be completed independently, which promotes accountability.*" **Interviewee** H

The detail of the Coding Data into Themes in Table 4.1 on Apendex B

4.5. Document analysis

Document analysis is done to validate the primary data that was obtained through interviews. The researcher tried to explore the documents from different websites and secondary data which exist in the sampled organizations. Such documents are vision, mission, policy and strategies. Additionally, the notice in the organization, fliers, brochure and digital signage's were also assessed.

- On the report of all African.com on November 22, 2012, it was cited from Fortune magazine, that MoCIT has built 49 e-service portals that will allow seven government agencies to provide online services by two private IT solution providers involved in developing and installing the e-service system, which cost 3.8 million Br, all was donated by the World Bank.

- Each of the case organization has its own mission and vision to attain its overall goal. Despite the fact that they all have a mission to maintain service quality, none of them contain e-service or any other ICT-related services.
- There is no any policy as a country. According to the findings on Digital Ethiopia 2025, worldwide regulation of the ICT sector and its dynamic, has a disruptive nature and it is difficult. In Ethiopia, this is also the case. Yet, the Ethiopian government prepared strategy and published in 2013 and implemented the e-service based on that strategy.
- Organizations prepare and announce advertisements by different mechanisms such as on their notice board, digital signage, making fliers and on their organization's websites and you tube to create awareness about the procedures how they use e-service; however, all of the organizations don't include the services rendered by the e-services to citizens and to the country at large.
- According to digital strategy 2025, Ethiopia's Internet coverage has risen at a 45 % yearly rate, which is slower than peer countries. Ethiopia has also seen a considerable increase in mobile subscriptions, with the percentage reaching 60% in 2017 (with 41% active subscriptions), but mobile penetration remains low in comparison to peer countries. A similar pattern can be seen in broadband access, with 7.1 % of active mobile broadband subscriptions compared to a regional average of 24.8 %. Internet coverage has risen at a 45 % yearly rate, which is slower than peer countries. Gaps in network coverage, price, and quality have all been cited as major issues. Currently, there is an inanities to upgrade woredanet and internet bandwidth to resolve these challenges. In 2018, 12% of Ethiopians made or received digital payments, 4% have debit cards, and 0.3 % (foreigners and diaspora) have credit cards, while Ethiopian banks do not provide credit cards.
- As explained on the digital Ethiopia 2025, low internet penetration, high data costs, low mobile penetration, low access to formal financial services (only 35% of the population is banked), lack of awareness of existing digital financial services, and a fintech industry that is just getting started due to regulatory constraints are all major challenges in this area. The absence of interoperability among banks, financial services, and wallets stymies growth, including the entry of new players for mobile money and financial solution innovation are also the other observed challenges.

- Current and future workers (particularly young) will need digital skills to satisfy the demands of a digital economy, embrace innovation, and maintain a competitive advantage. Digital skills offer meaningful access to government (through e-government portals), businesses (via e-commerce), and society for the general public (through social media). Lack of digital skills can have a negative impact on the economy's competitiveness and job growth.

  "*Ethiopia currently ranked 112 out of 149 countries on the World Economic Forum's digital skills index*[65]" Digital Ethiopia 2025, Pg. 76

Based on the data that are assessed from websites, the e-services were developed by external assistance by two consulting firms under MoCIT. In contrast, almost all the respondents on the interview mentioned that the e-service is developed by the government budget. However, independence from external assistance is basic to have sustainable e-services in the country.

All the case organizations have vision and mission. However, they didn't align their vision and mission with e-government service and with other IS in their organizational mission, vision and business process. It is difficult to provide quality service without the use of ICT. This affects both maturity and sustainability of the e-government services.

There is an e-government strategy in Ethiopia. The e-service portal is developed based on that strategy. But the country does not have any policy, guideline and manuals (which is under development) that are used to implement the service. This affects the maturity of the e-service as a result of which the service is going to fail.

Organizations try to develop awareness by showing the procedures on how customers can get registered on the e-service. On the other hand, they didn't tell to their customer about the benefits that they gain out of it. Due to that, customers still do not accept the e-service which makes the e-service fail or not to exist for a long time.

Even though the mobile user increased from time to time, still the digital dividend is less than half of the citizen and from this user, only 7.1% of the small number of the citizen are active subscribers of bandwidth. Due to this fact, the growth of e-service is affected and sustainability of the service also becomes under question.

There is also lack of digital skills in the country. Government services are more accessible with digital skills (through e-government portals). This affects the maturity and the sustainability of the e-service.

4.6. Discussion

The purpose of this study was to investigate the determinants of matured e-government services and to propose a framework to show the relationship between e-government maturity and sustainable e-government services. The study proposes a method for improving the long-term sustainability of e-government services by identifying maturity factors. This research aimed to answer the question "What are the determinants for matured e-government services?" And a conceptual framework is prepared to answer the question, "What is the relationship between e-government maturity and sustainable e-government services?"

Research Question #1: What are the determinants for matured e-government services?

In this section, the determinants of e-government maturity and sustainability with the corresponding dimensions of e-government were discussed based on the data collected from the case organizations. These days, e-services are widely used throughout the world, but they have not been efficient and sustainable, particularly in developing countries. Maturity is one of the critical sustainability factors for e-government. That is why this study aimed to identify the factors of maturity that affect sustainability. The findings from this study indicate that there are several organizational specific factors that affect the maturity of e-government that are in line with the previous research like ICT infrastructure development, human resource capability (Kachwamba & Hussein,2009; Krishnan et al,2017); managers' commitment to prioritize e-government projects; availability of an ICT department with an independent annual budget for e-government development, degree and frequency of customer contacts; organizational e-government operational plan and web age (Kachwamba & Hussein,2009).

At this time, the government allocates the necessary budget for the development of e-services. As a result, all government institutions could use it for free. More importantly, organizations do not set aside funds expressly for the development of e-services. All organizations have well-organized financial management in order to meet their objectives. Some organizations allocate more resources to technological advancement. Such organizations have robust infrastructure, such as

computers, networks, high bandwidth connections, tablets, and wireless devices. They may use the e-service even while they are out of the field. E-services will have a better chance of expanding and surviving in such institutions.

Each organization has its own information technology department with its own budget. However, because most organizations' ICT departments are structured as a support team rather than a core, their budgets are limited. It is not enough to develop an e-government system. Furthermore, due to a lack of experts on the team, they are primarily responsible for maintenance and support, limiting their ability to own and operate technologies such as e-service. Because of this, the majority of the company requires the assistance of a consultant on a regular basis.

External assistance is necessary for developing countries like Ethiopia because of lack of budget and skill existe in the organizations.When they collaborate with a consultant, the experts of the institution gain significant experience and the required budget for developmet. However,they have to receive and manage the service after they gain skill to have a sustainable e-service.

The majority of respondents believe that the service provider's or case worker's IT comprehension abilities change with time based on their age and level of education. Despite the fact that certain specialists are constantly trained, they may not fully comprehend the service. Because they don't understand modern technologies, older professionals may find it difficult to interact with the service and may be hesitant to continue working there. Because educated personnel can readily comprehend it, human resource competency is critical for the service's growth. Otherwise, they prefer to stick to the current service delivery or manual technique. One of the key reasons for the advancement of e-services is that many of the professionals in the institution are educated and can easily understand and use them. This gives the e-service a sense of ownership. Continuous training is required to utilize the service effectively and have competent expertise.

The presence of a dedicated manager in the institute allows them to quickly handle difficulties. However, the majority of them claim that managers are not very devoted because they have no expertise in the field and are just obligated to follow regulations. E-service requires more senior technical people to be involved rather than top managers because it requires no managerial decisions, but to make the service independent from external assistance by prioritizing the project,

when there is an infrastructure management issue, to create awareness and trust among citizens and to have a good working culture by using e-service, the role of top managers is very high.

Degree and frequency of customer contacts is one of the factors that affect growth of the e-service because such organizations have a high work load, they have more matured e-services. It is, therefore, preferable to utilize an e-service over a manual method and also make the customers aware of the system. As mentioned by most of the respondents, this helps to sustain the e-service. However, some of them said that this doesn't have any impact on maturity because for both companies that have high /low customer maturity, they are the same. In contrast, the infrastructure can not support a huge number of customers. The system will go down or fail if the frequency of customer contact is too high.

Almost all organizations are trying to create awareness by different means like advertisements on TV, ICT expo, printing booklets, putting them on bulletin boards, organizations' websites, YouTube, and digital signage which exists in the organization. Still, awareness could not be created for the citizens, and most people didn't know about the service and most people didn't know how to use it, which affects the long-term sustainability of the e-services.

The woreda net-based e-service has been launched. Although the quantity of e-services provided has expanded, the system's capacity remains inadequate. As a result, institutions began to use the internet. The internet has changed the way e-services are granted, yet there is still a network connectivity issue. Incompetence may also be observed in the host system, which makes it difficult to add new services due to a lack of adequate servers and the absence of the necessity for a backup server. Because of a shortage of internet bandwidth, the service will also be disrupted from time to time. These obstacles prohibit the service from reaching its full potential and may make it unsustainable. Other challenges include infrastructure and service incompatibility. There is an infrastructure challenge at the national level; we don't have a data center that meets the requirements of organizations. All government agencies are constructing tiny data centers in a fragmented way, which has to be changed. According to the majority of respondents, infrastructure is now a serious issue. In fact, effort is being exerted to fix it. Internet capacity is improving, but it is still insufficient. This affects the access and connection of the service. However, even if our country's digital dividend affects e-service, the telephone, internet, and non-telephone sectors of society can visit an internet café, which has become a new field for young people.

The e-service improved from time to time which means as the website is evolving; new services are being added all the time, and functionality is increasing the infrastructure upgraded and will be used state of the art technology. Professional experience is growing, as in consumer acceptability and awareness on citizens increased indicating that the e-service is improving and will continue to mature. This makes the e-service is going to be sustained.

The process has been challenging and the paperwork has not been totally halted due to the absence of integration across services, as a result of which employee performance has decreased. Consequently, if this continues, the service has not matured, and the viability of the granting e-service is in doubt. Besides, there is no cross-institutional integration; rather, work is completed by a single institution. This makes the user prefer one institution which has an e-service and another that does not, the user will have the same experience as if they were using a manual system, and their interest in using it would decline, slowing the e-service.

The only institutions that are ready to use the service are allowed to apply by assessing their e-readiness. E-readiness tests were completed before development began.

The consumer mode of payment was not integrated with the internet due to a lack of connectivity between institutions and services. Hence, clients pay service fees through the bank. As a result, this affects the financial management in the organization, and the e-service sustainability is in doubt. All of the respondents agreed on this issue.

Political strategy has its own implications. Strong and binding laws in terms of the use of e-services are very important. They think the public and institutions will use the service to a greater extent. If such things are properly used, the service delivery will have a high rate of sustainability and the public at large will feel that they have secured data and have developed trust in the government. This makes the system more mature, but there are no rules, regulations, or policies in the organization. This issue was agreed upon by all respondents.

In most government organizations, political leaders are changed frequently. As a result of this, a lack of uniform working procedures existed in the organizations most of the time. New leaders designed their own systems, as mentioned by **Interviewee** C. So, as the working procedures of institutions are established by the leaders, work must be restarted from the beginning because there is no permanent structure in place. Moreover, **Interviewee** A said that one of the issues we

encounter is that leaders are changed from time to time, and as a consequence, when you talk about what you're doing and the system's overall advantages, leaders change again, and when you go to work, everything swings back and forth. One of the things that keeps us from performing at our best in the service is frequent leadership changes. Most of the respondents agreed that this issue affects the long-term sustainability of the e-service. Indirectly, it is also a barrier to maturity because it needs leadership commitment..

A clear vision and strategy that leads and supports the whole e-government implementation process while focusing on the achievement of specified and well-articulated e-government goals is critical for effective e-government considerations. According to **Interviewee M**, their organization's vision, goals, and strategy are being developed using technology. One of them is to utilize the service to complete a task, and as a result, the service continues to expand and survive. Some of the respondents agreed that by integrating technology-related plans into their institutional planning operations, e-service is also included. Yet, **interviewee G** explained that their organization has no vision, goal, or strategy that involves e-services or other technology. They didn't include it in their approach since they considered it a standard instrument for conducting their task. Unlike the one that failed, all of the respondents who have a long-term e-service said they include e-service and other technologies in their vision, aim, and strategy.Almost all organizations don't have a long-term vision in relation to e-service. This affects the sustainability of the services.

Organizational culture has an impact on the maturity of e-services because organizations with a positive culture are more likely to accept and use the service effectively. Some organizations have a strong work ethics and a culture of collaboration, which has helped them maintain their service.In organizations with a good working culture, launching e-services is not difficult. It helps individuals deal with issues and stay motivated. Most of the respondents stated that they work in a comfortable environment and are committed to complete their tasks. Using the e-service, the expert also works on weekends to keep the service functional. According to **Interviewee** H he feels that e-service will improve their company's work ethics, because each assignment assigned to a worker must be completed independently, which further fosters accountability. Generally, most of the respondents who have a sustainable e-service mentioned that they operate as a team and have a great working

culture. This allows them to use the e-service and share their knowledge to do their responsibilities more effectively.

The interview results of the respondents show that all the above factors can affect the maturity and sustainability of e-government in one or other way. So, the above factors are valid and must be considered during the implementation of e-government services.

Newly Added Factors Based On the Empirical Data

The interview results of the respondents help the researcher to find out new factors that affect the maturity of e-government services. Staff retention, citizen satisfaction, institutional instability, and the political environment are among these factors.

Staff Retention: Staff retention is basic for organizations because of the reason that staff turnover has a significant impact on e-service maturity because it burdens other specialists, forcing them to become preoccupied with day-to-day work rather than attempting to improve the service. In addition, continuous training is necessary since most IT experts in most firms lack appropriate competence in this area. However, due to high staff turnover, some trainees who are selected for training by the institution do not work in the appropriate position, and others who are trained do not return to work following the training. However, a few of them replied that staff who are recruited into the company do not leave the organization frequently, and professionals who work on the e-service are continuously acquiring experience, which has contributed to the growth of the service and has made the service delivery more mature. This assists the organization's viability by creating a sense of ownership.

Customer Satisfaction: Customers always have complaints about the service and need to depend on the manual system. Hence, this affects the maturity of the service, which eventually leads it to a total failure. Whatever service is provided, it will not be viable without a citizen's request.

Institutional Instability: In the context of Ethiopia, organizations are not stable due to the fact that their structures depend on the governments that lead the country. When the government changes through an election, the new government changes the privilege system. There is no fixed governmental structure as a country based on study. This has affected the maturity of e-government in different ways.The institute that has continuously changed has had an influence on the transfer of professionals to different locations. The replacement of trained professionals with new untrained

professionals will require new training and they will not feel as comfortable as they did for a long time because they are doing the work like a new one, which will not keep the service in place for a long time. If the institution does not have a stable long-term vision, mission and policy are constantly evolving, making the service a fresh start. Citizens are confused when there is institutional instability, they may not understand how to use it because it changes service location, and they will be interrupted for a long time until the institution is stable. According to the **interviewee, A:** When the institution is stable, it gives professionals the confidence to do their job and gives them a sense of belonging. Professionals who have been trained in e-service stay in the industry for a long time, and as their experience grows, they can easily identify gaps in the service and fix them, thus making the service grow. Further, the human capital in the institution is growing because trained professionals share their knowledge with others, which in turn promotes the e-service.

Political Environment: The political environment has an influence on our e-service maturity. For example, network service is disconnected in conflict regions, and as the political environment changes, so does the policy, and political leaders change, which has an impact on government e-services. Due to our country's present political crisis, the political environment has an influence on service development. The Internet came down in some regions, while network infrastructure was destroyed in others. As a result, e-service growth was interrupted and, in some areas, it failed.

Rejected Factors

In contrast to what has been found in the literature, a few of the factors have no impact on e-government maturity in Ethiopia. Organizational leadership and management, organizational size, personalization, and one-stop shopping are all factors to consider. Almost everyone who responded said that such variables had no influence on the maturity of e-government. This is because these determinants were already in place when e-government was deployed. All of the respondents said that the organization had both leadership and management but that neither had an impact on maturity. The size of an organization has no impact on the maturity of e-government; both large and small organizations do the same. Ethiopia's e-government platform also serves as a one-stop shop for services to citizens because it consolidates most government services into a single window.

Research Question #2: What is the relationship between e-government maturity and sustainable e-government services?

The figure 4.1 below shows a revised conceptual framework that can show the relationship between maturity and sustainability of e-service in the case of Ethiopia. This framework is a case-substantiated and revised version of the initial conceptual framework based on literature.

Figure 4.1.Revised Conceptual Framework that show the relationship between maturity and sustainability

4.7. E-government Maturity and Sustainability Relationship Framework Evaluation

According to Hevner et al. (2004), artifacts should be evaluated using criteria based on the requirements of the context in which they are implemented, such as "functionality, completeness, consistency, accuracy, performance, reliability, usability, fit with the organization, and other relevant quality attributes." Artifact evaluation is an important part of the development process because it ensures that the developed product will improve and function in a real-world setting.

The researcher selected expert evaluation methods. According to Peffers et al. (2012), expert evaluation is one of the methods that are used for the assessment of an artifact by one or more experts. This method is used for framework type artifacts and applies to the artifact in a real-world situation to validate its usefulness and other relevant quality attributes.

The e-government maturity and sustainability relationship framework should be evaluated by area experts to prove the quality of the developed framework and its applicability. Functionality, reliability, usability, completeness, consistency, accuracy, and fit with the e-service in the organization are the measuring criteria used to analyze the relationship between e-government maturity and sustainability.

In this research, an expert evaluation method is used from the four selected organizations by using interviews to evaluate the proposed framework. All the selected experts confirmed that each factor should be included in the framework. The evaluation was chosen to get the different viewpoints of the experts. Choosing different experts for evaluating this framework will help to gain valuable knowledge at different levels.

4.7.1. Evaluation Feedbacks from Area experts

From the organizations that have sustainable e-service

Interviewee G -Case worker

"From my point of view, this framework helps to identify the factors that affect the maturity of e-services, which in turn affect sustainability. Knowing this helps which aspects of the organization

should be improved and support the growth of our e-service from time to time so that the organization will have long-term sustainability."

Interviewee L-IT Director

"Our organization will benefit from this framework. This framework helps to shape the structure of the whole e-service utilization process. By following this framework, we will improve our service quality, the growth of the service, and keep our e-service sustainable. I believe this framework could be consistent and accurate with other IS systems that are found in any organization."

From the organizations which did not have sustainable e-service

Interviewee D-IT Director

"From my perspective, this framework is very important not only for e-service, but it can also be used for other systems that are developed in the organization to be mature and sustainable. All the determinants shown in the framework affect the long-term sustainability exactly. If we use such frameworks and models, beginning with the development and implementation of e-services, they may fail or can last for a longer period of time. The reliability and usability of each determinant in maturity and sustainability and the relations between them which are included in this framework are valid and acceptable. "

Interviewee K-Case worker

"If we had had such a framework before the implementation of e-service, our organization would not have failed. This framework contains all the factors that affect the sustainability of our e-service. It helps us to know the characteristics of maturity. I hope we will start using e-service to deliver quality service to citizens by following this framework."

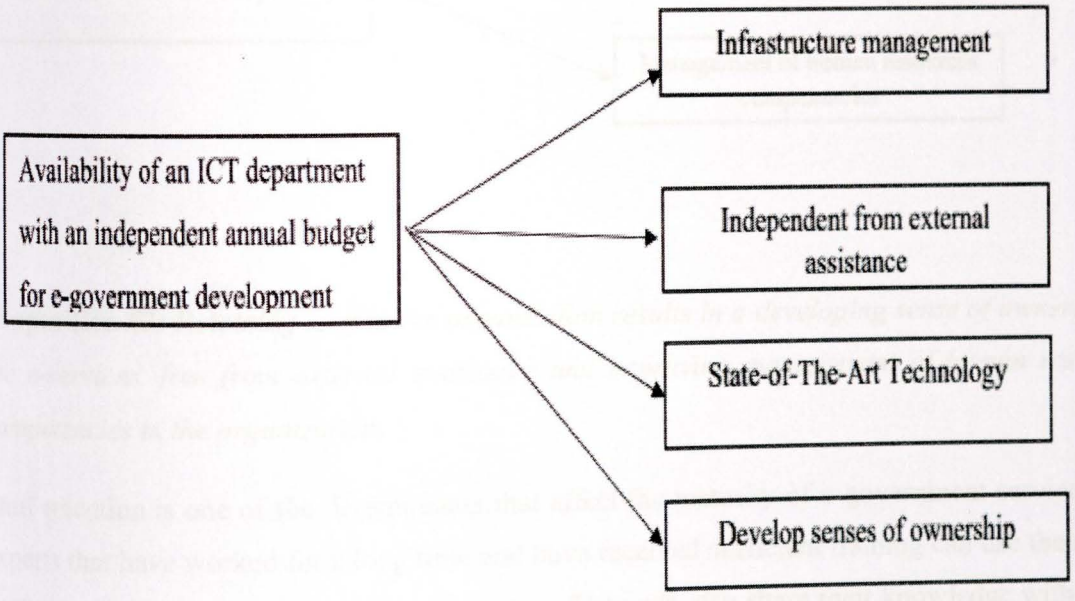
4.8. Theoretical Propositions Emerged from the Framework

Based on the revised conceptual framework, discussions, and findings presented in the previous chapters of the empirical work, possible relationships among the determinants of the two concepts (maturity and sustainability) of e-government services are presented in the form of theoretical propositions as follows. This is aimed at enhancing the sustainability of e-government services in Ethiopia. A building proposition on the relationship between the factors that affect maturity and

sustainability of e-government evaluation dimensions has emerged out of considering the insights obtained from the case study work by relating them with the review of literature.

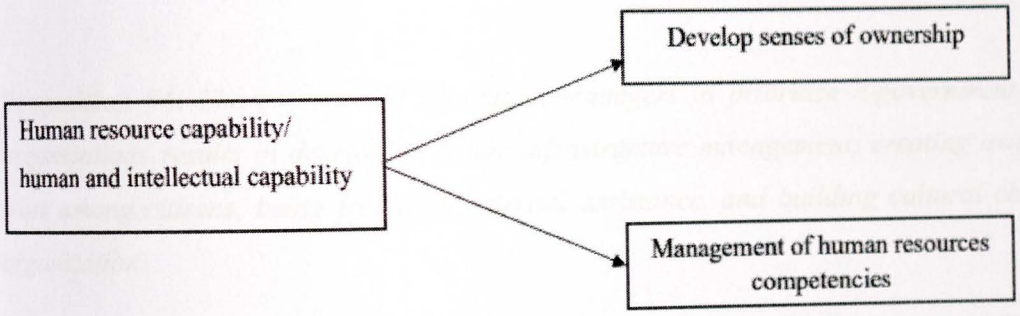
Proposition # 1: *The presence of an ICT department with an independent annual budget for e-government development results in improving infrastructure management capacity, increasing the capacity to use state-of-the-art technology, and is free from external assistance.*

The government's IT department is in charge of the e-government effort. Sufficient funds must be provided in order for this program to be realized. The availability of an ICT department with an independent annual budget for e-government development is one of the factors that affects the maturity of e-government. Meaning, the presence of a strong ICT department in the organization in terms of skills and budget helps to have a long-term IT infrastructure that can be managed by the department and that leads to the use of state-of-the-art technology. Organizations with a core ICT department can manage the e-service with their own skilled expertise and budget, developing a sense of ownership and making them self-sufficient, or they can be independent from external assistance.



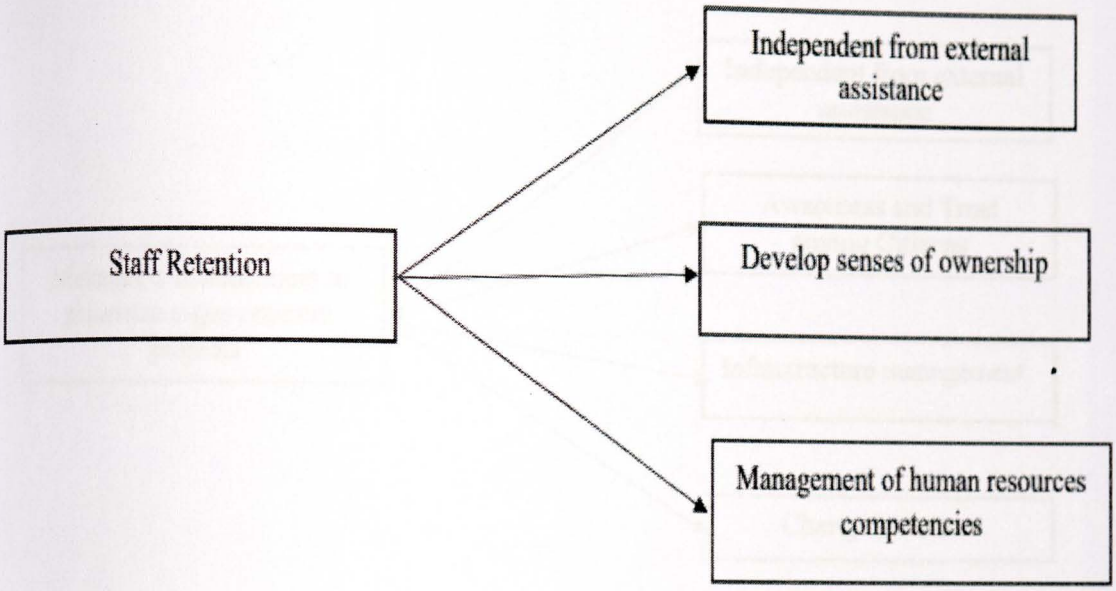
Proposition #2: *Increasing an organization's human resource capability (human and intellectual capability) results in a sense of ownership of the e-services and improved management of human resource competencies.*

Human resource capability (human and intellectual capability) is one of the factors that affect the maturity of e-government. For the successful development and implementation of mission-critical initiatives in e-government, skills, expertise, and competencies in the areas of business skills and competencies are essential. To have such skills and competencies, continuous training and sufficient awareness of information technology must be given to the case workers to manage human resources competencies, and this will develop senses of ownership. Trained experts can use the e-services with good efficiency and effectiveness. This helps to mature e-government services and also leads to sustainable e-services in organizations.



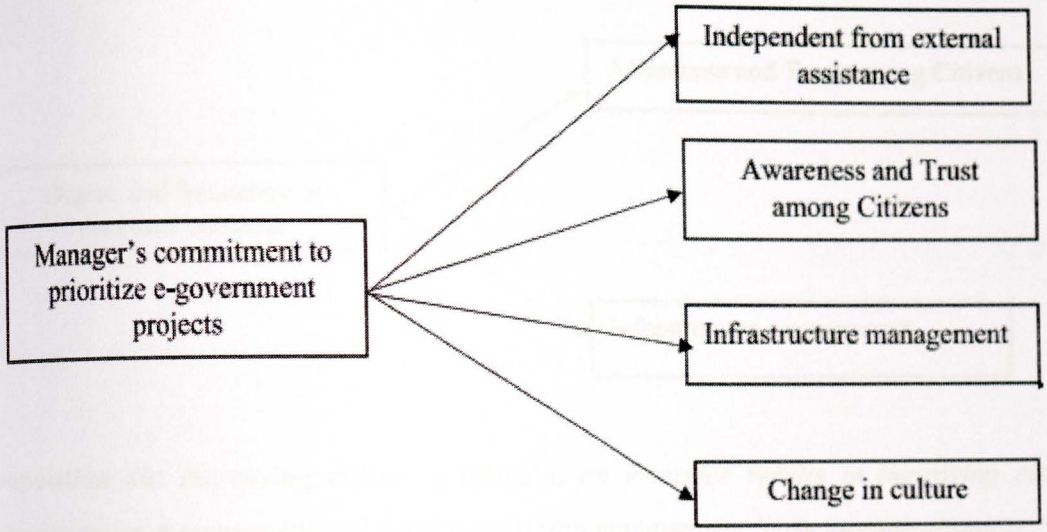
Proposition #3: *Retaining staff in the organization results in a developing sense of ownership of the e-services, free from external assistance and improving management of human resources competencies in the organization.*

Staff retention is one of the determinants that affect the maturity of e-government services. The experts that have worked for a long time and have received sufficient training can use the system easily, and this will increase their performance. They can also share their knowledge with others and work as a team by increasing their human resources competencies and developing senses of ownership. This makes the e-service independent from external assistance.



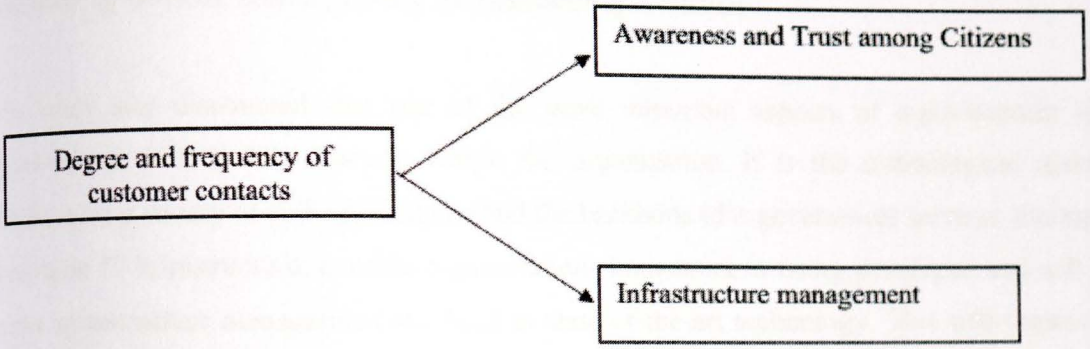
Proposition #4: *The presence of committed managers to prioritize e-government projects in organizations results in developing better infrastructure management, creating awareness and trust among citizens, being free from external assistance, and building cultural change in the organization.*

In this study, it was indicated that organizations that have committed managers to prioritizing e-service projects can have more matured e-services. In such organizations, there will be better infrastructure, networking, computers, and bandwidth. This will help the e-service be sustainable for the long term. Additionally, they can manage customer complaints and create awareness and trust among citizens. They can also provide support for the experts to have continuous training. This helps the organization to have skilled experts that provide the service effectively using the e-service. This will make the service free from external assistance, and this kind of manager can change the working culture of the organization.



Proposition #5: *Increasing the degree and frequency of customer contact with e-services raises awareness and trust among citizens and ensures access to infrastructure by ensuring infrastructure management.*

The study also pointed out that organizations with large and frequent client connections are more likely to be recognized at higher stages of e-government maturity than organizations with low customer interactions because of substantial public demand.On the other hand, companies with a high number of client contacts have more mature e-services. Due to their work load, e-service is preferable to the manual system. They would endeavor to strengthen their infrastructure and bandwidth to provide excellent service to citizens because they have strong client demand. Moreover, if there is high customer contact, it increases the awareness and trust among citizens because e-services are known by a large group of people.

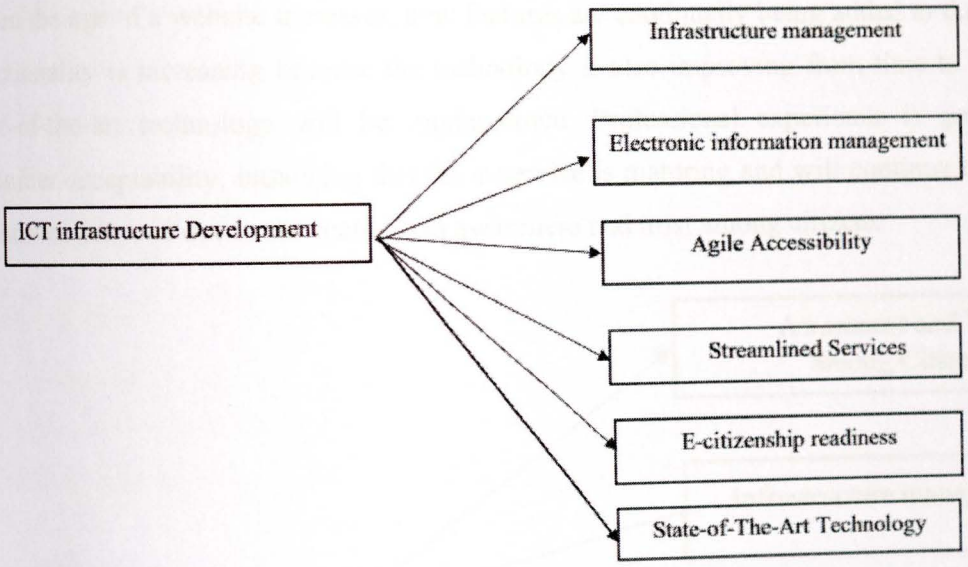


Proposition #6: *Increasing citizen satisfaction on e-service results in improving citizenship communication management and service provision management in the organizations.*

The research also found that customers are complaining for different reasons, like lack of access to technology, network outages, and that a majority of customers find the e-service difficult to understand and utilize. This feedback helps the organizations identify the gap and improve the service. This means the e-service will be more mature and also be sustainable for the long term. When the satisfaction of citizens increases, they can use the e-service through technology, which will create good interaction with the e-government. This leads to improving citizen communication management. Yet, the government also has to give emphasis to the use of technology and a significant focus on citizens in order to maintain and optimize relationships with them. It is utilized to improve new forms of public participation in governance. By increasing accountability and fostering information sharing, this relationship between government and citizens is critical to the growth of e-government.

Proposition #7: *Developing ICT infrastructure in organizations results in better infrastructure management; managing electronic information efficiently; creating agile accessibility; streamlining services; and improving the readiness of e-citizens*

The study also discovered that one of the most important aspects of e-government is the development of ICT infrastructure within the organization. It is the technological operating platform for a variety of ICT applications and the backbone of e-government services. On top of a long-term IT infrastructure, a stable e-government framework is being developed and will have better infrastructure management and lead to state-of-the-art technology. This will improve the digital divide among residents and ensure the existence of quality information. Moreover, the services are streamlining and improving the readiness of e-citizens.



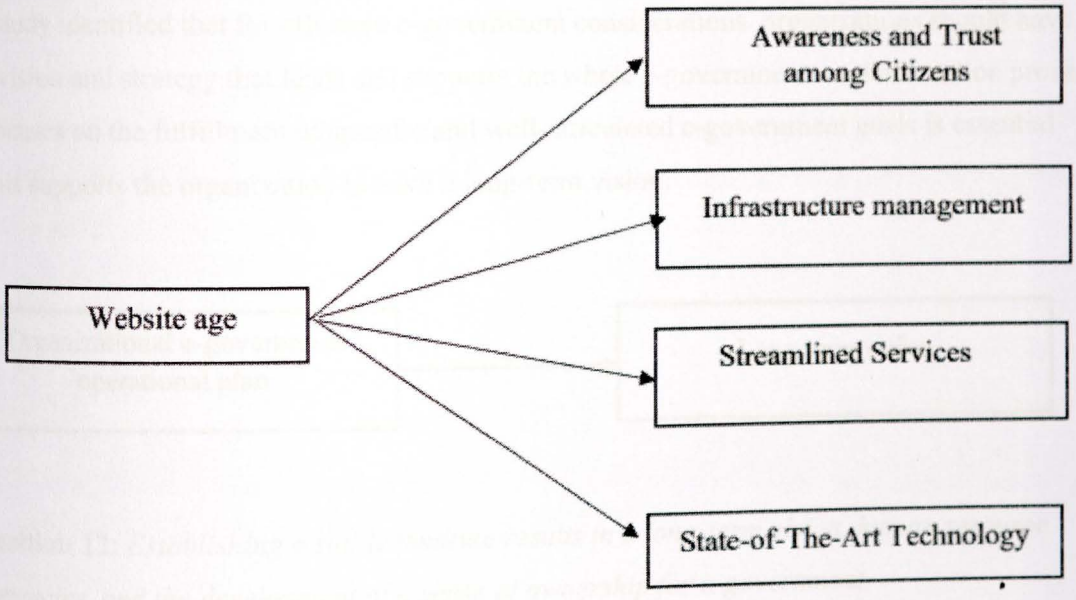
Proposition #8: *Creating integration between services on the e-services within the organization and between different organizations, developing streamlining services.*

In this study, it was indicated that integration between services is the basic factor for the growth of e-services because it affects the performance of employees in the organization. Individual and fragmented electronic government systems are also becoming less financially sustainable for developing countries, as their maintenance requires significant resources and duplicates

government functions. Yet, developing integration between different organizations will make the service centralized or networked, and this makes the service effective and increases productivity by streamlining the services.

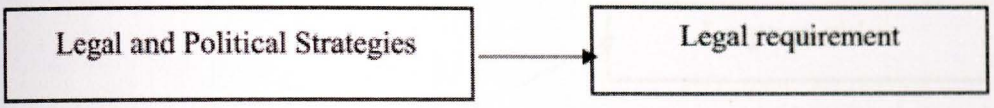
Proposition #9: *When the age of the website increases, the level of awareness and trust among citizens increases. They actively manage infrastructure, streamline services, and advance the e-services by using state-of-the art technology.*

When the age of a website increases, new features are continually being added to the website. Its functionality is increasing because the technology is also improving from time to time and the state-of-the-art technology will be implemented. Professional experience is growing, as is customer acceptability, indicating that the e-service is maturing and will continue to evolve and streamline services due to the increase in awareness and trust among citizens.



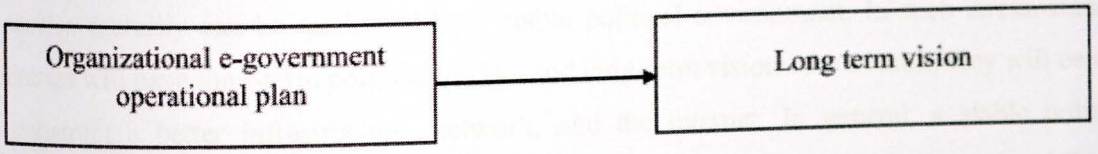
Proposition #10: *Developing legal and political strategies for the use of e-government services results in having a legal requirement on the use of e-services in the organization .*

The study indicated that e-government is an institutional issue; rules and regulations should be in place to support the policy. So, rules and regulations are an effective factor in the implementation of sustainable e-government because they play a constructive role in resolving related challenges, improving coordination between related sectors, providing technical facilities, assisting in the implementation of infrastructure projects, and strengthening institutional goals.



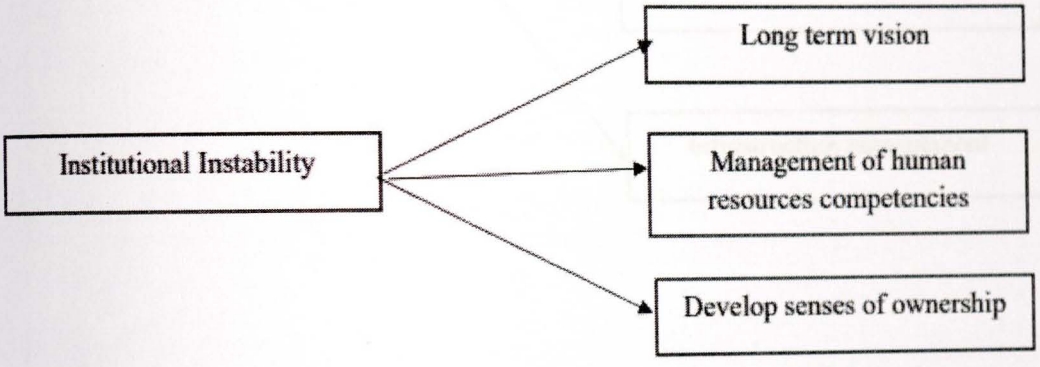
Proposition #11: *Developing an organizational e-government operational plan results in having a long-term vision.*

The study identified that for effective e-government considerations organizations should have a clear vision and strategy that leads and supports the whole e-government implementation process and focuses on the fulfillment of specific and well-articulated e-government goals is essential and this supports the organization to have a long-term vision.



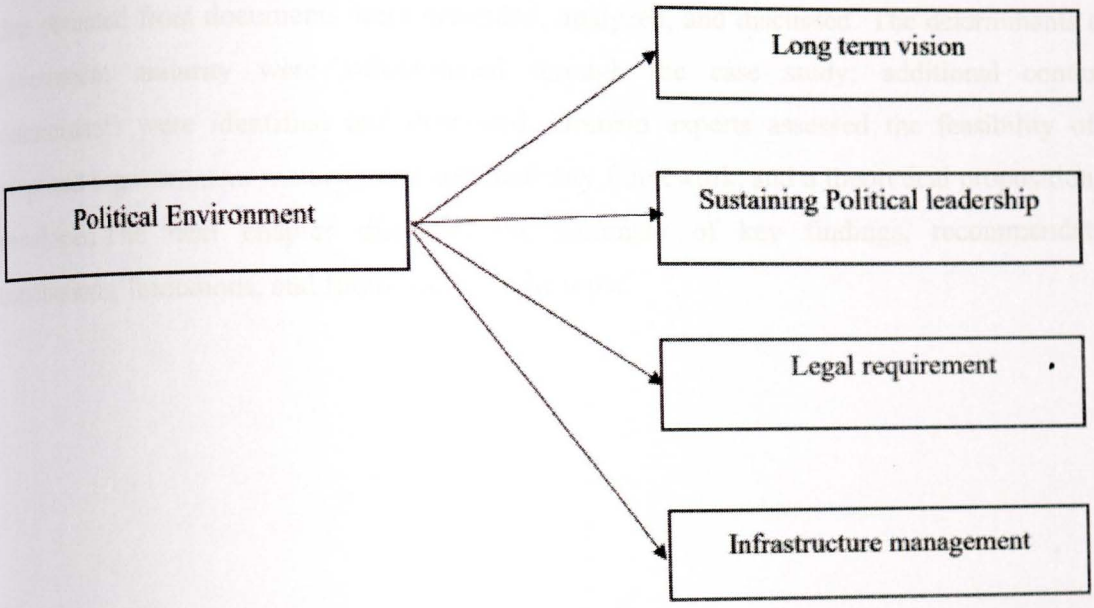
Proposition 12: *Establishing a stable institute results in a long-term vision, human resource competencies, and the development of a sense of ownership for e-government.*

The study indicated that building the structure of the institute as a country once and building a system that helps the country to have a long-term vision.Furthermore, in a stable institute, there will be trained professionals who can easily use the e-service. In such organizations, the management of human capital is high. This helps to create a sense of ownership and can have sustainable e-services.



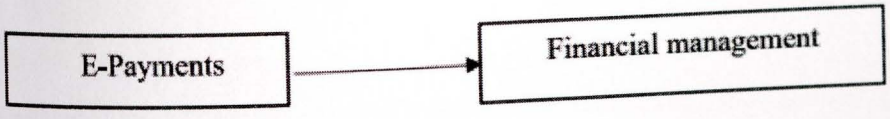
Proposition #13: *Having a stable political environment results in long-term vision, sustaining political leadership, having legal requirements, and managing infrastructure in the organization effectively for a long time.*

E-service maturity can be facilitated by a stable political environment. In such circumstances, countries will have long-term political leaders and long-term visions. As a result, they will be able to construct a better infrastructure, network, and the internet. In general, a stable political environment is required, as is good infrastructure management.Infrastructures have the ability to last a long time and mature. Governments also design the legal requirements for organizations to use e-services.



Proposition #14:.*Integrating e-payment into e-services leads to better financial management in the organization.*

The study shows that e-payments are an electronic or digital way of transferring money and are a part of the customer mode of payment that has to be integrated with e-service. Essentially, the customer can utilize electronic payment methods to transfer payment as an alternative to cash payments. This can boost the e-service growth and also help the organization to have better financial management.



4.9. Chapter Summary

In this section, the qualitative data collected from the respondents of the research and the secondary data obtained from documents were presented, analyzed, and discussed. The determinants of e-government maturity were substantiated through the case study; additional contextual determinants were identified and discussed. Domain experts assessed the feasibility of the proposed e-government maturity and sustainability framework, and a theoretical proposition was developed.The next chapter discusses the summary of key findings, recommendations, conclusions, limitations, and future work on the topic.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

In this chapter, the summary of the key findings, conclusion, limitation of the study, and recommendations are presented. Suggestions on future works on the topic are also forwarded to help other researchers to extend this study.

5.2. Summary of Key Findings

The purpose of this study was to identify the determinants of e-government maturity and map them to a sustainable e-government service and propose a framework. The framework is aimed at enhancing the sustainability of e-government services. To achieve the objective of the research, a qualitative approach was followed and primary data was collected by using semi-structured interviews and secondary data was assessed from documents. A case study method was adopted and the Ethiopian Construction Authority, the Accounting and Auditing Board of Ethiopia, the Ministry of Justice, and the Ethiopian Basin Authority were selected as cases. In addition to this, the researcher included MinT and Perago Information System PLC for data collection due to the fact that they developed and implemented the e-services for the researched organizations. An extensive literature review was conducted to identify the determinants of e-government maturity and to conceptualize a framework. An interview protocol was developed from the conceptual framework. A face-to-face interview was conducted with the interviewees on the system users (case workers), top managers, IT teams, IT director, project manager, project coordinator, and consultant.

Thematic analysis was done to identify, analyze, organize, and evaluate the determinants of e-government maturity and sustainability. Most of the participants in all of the four selected case organizations and the developers explained that the main determinants of e-government maturity are: availability of an ICT department with an independent annual budget for e-government development; human resource capability or human and intellectual capability; manager's commitment to prioritize e-government projects, degree and frequency of customer contacts, ICT

infrastructure development, integration, website age, legal and political strategies, organizational e-government operational plan,Integration and e-payment.The respondents said that these determinants are the basic factors that affect the maturity of e-services.

In addition to these types of determinants identified from the literature review, the researcher found some new types of e-government maturity determinants to be included from the data in some of the dimensions of e-government. The newly identified types of e-government maturity determinants are: staff retention and customer satisfaction in the social dimension, issues concerning the political environment in the political dimension; and institutional instability issues in the institutional dimension.

The following six types of determinants of e-government maturity identified during the literature review were excluded after the case investigation. Organizational leadership and management in the social dimension; organizational size in the institutional dimension and personalization; e-participation,customer centricity and one-stop shop service in the technological dimension.

5.3 Conclusion

The vision of the e-government strategy has four key elements: bringing the government closer to the people, effective governance, improved service delivery; and socio-economic growth. This helps to increase the awareness levels of the people, to create a sense of ownership, and makes government organizations more effective and efficient. It also builds capacity for public servants on skills that enable them to serve the customers, enhance the quality of service delivery, and lower the cost of doing business. In line with this, the objective of this research is to develop a conceptual framework that maps e-government maturity to a sustainable e-government service that can help to ensure the sustainability of e-services.

As e-service requires a huge investment, it should be sustainable to leverage the value out of the investment in the long run. Otherwise, it is hard to gain the advantage that it is supposed to provide. One of the critical sustainability factors in this regard is maturity. The outcome of this study has both theoretical and practical implications. This study sought to investigate a less-studied topic (i.e. e-government maturity and sustainability) by finding the relationship between the two constructs. The research work proposes a method for improving the long-term sustainability of e-government services by identifying maturity indicators. As a result, it enriches e-government

iterature and can also be utilized as a starting point for other academics to conduct further esearch.

The research also has a practical contribution for policymakers and practitioners. The study helps practitioners construct mature e-government services, which lowers development costs and increases system performance, efficiency, and effectiveness. This circumstance can help to create confidence, minimize corruption, and improve the country's political status, and e-government services can eventually be accepted and trusted by all citizens. The findings of this study can assist other government organizations in documenting and learning about the relationship between e-government maturity and sustainability.

When e-government maturity declines, the effectiveness, efficiency, accountability, transparency, and quality of service delivery to citizens and businesses will be in question and it can affect the sustainability of e-government initiatives. This in turn jeopardizes the country's democratization effort. Hence, this study was conducted because previous studies have not addressed the associations between maturity and sustainability of e-government identified in this study. The proposed framework in this research is aimed at enhancing the sustainability of e-government services.

5.4. Study Limitations

This research adds value to the existing knowledge regarding the maturity and sustainability of e-government services. This study has the following limitations:

- This study represents the respondents' attitudes towards the factors that affect the maturity and sustainability of e-service on different dimensions of e-government.
- This study only focused on the e-service on the e-government portal of Ethiopia.
- Due to time constraint there is limited number of participant involved.
- The e-government maturity and sustainability indicators in this study are assessed from the government portal of Ethiopia. Citizens were not involved in the study and this might limit the attitude of citizens on the e-service maturity and sustainability they may have different views.

.5. Recommendations

ased on the key findings of the study, the researcher recommends the following points to address hallenges hindering the maturity and sustainability of e-Government initiatives:

- In Ethiopia, infrastructure are inadequate, and there is no consistent internet connectivity. In such situation, cloud computing infrastructure can considerably assist the adoption of e-government services by providing data backup, security, unlimited data storage and provide quality service. It also can help save money by utilizing cloud-based e-government, it is easy to manage with a small number of skilled IT team, which can inturn help to ensure the sustainability of e-government.
- Almost in all government organizations, the ICT departments were organized as a support team not as a core unit. ICT departments have to be core units with skilled team members and independent budget should be allocated for the development of e-services.
- Organizations owning the e-services should create citizens' awareness through different mechanisms promoting the benefits of e-government services.
- Organizations should align e-government services to their organizational vision and mission to have sustainable e-government.
- Policy and subsequent legislations are important to have legal foundation and to make the e-government decision-making process formalized to assure transparency. This can build citizens' trust and help the growth of the e-government initiatives in the country.

5.6. Future Works

The purpose of this study was to identify the determinants of e-government maturity and map to a sustainable e-government service and propose a framework. The framework is aimed at enhancing the sustainability of e-government services. The following are potential avenues for future research as a followup to extend this research.

- The proposed conceptual framework has been evaluated by using case studies from Ethiopia. Further study is recommended to evaluate the applicability of the proposed framework in different countries' contexts.
- As this research is conducted on e-services delivered through e-government portal, conducting on other channels (like, Call center, Mobile devices and Common service centers) can help to generalize the study result to different types e-government services.
- Finding additional determinants can deepen our understanding of maturity and sustainability of e-government services and can help extend or refine the proposed conceptual framework.
- Conducting quantitative research to test the proposed relationships can enhance validity and feasibility of the proposed framework.
- Conducting a cross-case study across nations and making a longitudinal investigation of e-government maturity and sustainability.

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APPENDICE

Appendix A: Interview Questions

Section 1: General and demographic question

- ✓ Can you tell me your background (the highest level of university academic level, and field of study)?
- ✓ Could you please tell me the background and objectives of the organization you are working on?
- ✓ How long have you been working in the organization and department and position in your organization? (Job experience including within and outside this organization)
- ✓ Could you please explain the anticipated role of your position? What is your responsibility? In what sort of project, you are involved in, especially in the e-government service project area?
- ✓ Have you ever taken any training related to ICT? Especially those are related to the e-government service?
- ✓ Is your e-government system working properly? Are there any mechanisms like monitoring and evaluation that assess whether there is a gap or not? If there is a gap, what kind of mechanisms do you use to solve that problem?

Section 2: Understanding of economic factors of e-government service that determine maturity and sustainability that are related to financial management, independent from external assistance, and identify how and why affects the maturity and sustainability of e-government service?

- ✓ Do you think financial management in an organization is critical to having matured and sustainable e-government service? Why?
- ✓ Do you think external assistance in terms of finance, human resources have an effect on e-government maturity and sustainability? Why? Is it better to make independent from external assistance? Who should take the initiative to study whether there is a system gap and based on that design a mechanism to address it?
- ✓ What do you think about the availability of an ICT department with an independent annual budget having an impact on the maturity and sustainability of e-government? How?

Section 3: Understanding the Social factors that determine the e-government maturity and how it affects the sustainability of e-government in terms of human capital, leadership, and management, Manager's commitment, Degree and frequency of customer contacts, etc...

- ✓ Do you think increasing wealth in a country can influence human capital? How? What kind of relationship does it have?
- ✓ What is the influence of the proper function of the e-government system on human capital?
- ✓ Do you think the population literacy education level is likely to influence the growth of e-government? How?
- ✓ Which group of people mostly uses your website? In terms of sex \age group?
- ✓ Do you think the human capital (talent and knowledge) assets in the organization are considered organizational capital? Why? Does it have an effect on e-government maturity? How?
- ✓ Do you think human capital is a factor to fail or success in e-government service?
- ✓ What do you think if the government commit huge resource to technology and human capital does it have an influence on the maturity and sustainability of the system?
- ✓ Is their lack of ICT skill and knowledge in the public sector especially in your organization?
- ✓ Do you think there is insufficient communication in your organization?
- ✓ Are all the above possible reasons for the e-government program's failure (not to mature /sustain)?
- ✓ Is your organization give any training that is related to e-government service to employees? Is it demand-driven (based on the challenge that exists in the organization) or supply-driven (given by other bodies /donors)?
- ✓ How many employees did take the training? Are they still existing in the organization or leave after training? How is the staff turnover in your organization? What is their reason to leave the organization? Can the training help you to identify the gaps and help you to solve the problems in the service?
- ✓ After they take the training did, they do anything that supports the system? Are they committed to supporting the system? What would be the driving factor that didn't make them commit?
- ✓ What do you think about the satisfaction of employees? Are they satisfied with their job?

- ✓ Does the government make a salary increment for the trained employees did they get any benefit?
- ✓ What is the role of leadership in your organization on e-government service? What is the role of managers in your organization on e-government service?
- ✓ Do you think e-government needs both leadership and management to mature or sustain? Why?
- ✓ What do you think the manager's commitment to plan /prioritizes e-government projects does it have a contribution to e-government maturity/sustainability?
- ✓ Do you think organizations that have a clear vision and strategy and also well-articulated e-government goals can have a more matured and sustainable e-government? Why?
- ✓ Do you think the lack of vision in the organization has an effect on sustainable e-government? Why?
- ✓ What do you think about developing a sense of ownership? Does it have an impact on e-government maturity and sustainability? How?
- ✓ Do you think employees in government organizations may lack sufficient awareness about ICT and have not received proper training for the success of e-government service? Why?
- ✓ Do you think awareness and trust among citizens have an effect on e-government maturity and sustainability? How do you create awareness for citizens?
- ✓ Do you think the link between government and citizens via the use of technology can increase transparency, trust, and open communication with government officials? Does it have a role for e-government maturity? How?
- ✓ What do you think about the citizen-centric e-government services what kind of impact does it have on sustainability? Does it have a contribution to e-government maturity? Why?
- ✓ Do you think the readiness of people to implement e-government service has an influence on the success and sustainability of e-government? How much has your organization tried to make the public ready?

Section 4: Understanding the Political factors that determine the e-government maturity and its contribution to the sustainability of e-government

- ✓ Do you think the country's political structure, fair processes, and legal protection of property rights have an impact on e-government service? Why?

- ✓ Do you think there are national governance institutes that enforce such as the rule of law (organizations that have a good political structure, fair process, and legal protection) do you think this has an influence on e-government maturity? How?
- ✓ Do you think a lack of policy and strategy in an organization result in failure for e-government? How does it affect the e-government service?
- ✓ Do you think sustaining political leadership at various levels of government has an influence on the maturity and sustainability of e-government? Why?
- ✓ Do you think an e-government service improves government performance? How?
- ✓ Do you think an e-government service increase satisfaction of customer? How? Does it have a contribution to e-government maturity and sustainability?

Section 4: Understanding the technological factors that determine the e-government maturity and how this factor affects the sustainability of e-government

- ✓ Do you think the status of ICT infrastructure in a country influences the maturity of e-government? In terms of physical infrastructure, on the government website and availability of bandwidth available for the home user? Explain in the context of your organization?
- ✓ Do you think the level of ICT development directly assists (or hinders) the creation of delivery e-government service to the public at large?
- ✓ Do you think organizations which have more advanced ICT infrastructure are also more inclined to do government-related business online (Use e-government service)?
- ✓ What type of technology do you use in your organization? Is there any state-of-the-art technology like cloud computing? How does it affect the maturity and sustainability of e-government?
- ✓ Do you have a data center in your organization? Disaster recovery mechanisms, business continuity plan (BSC), Network infrastructure (LAN and WAN) what is their contribution to your e-government maturity?
- ✓ To what extent do the member of your organization and stockholders have access to ICT the hardware and service on the portal? What is the trend in using the portal?
- ✓ Is there stockholder involvement starting from the design of the e-government services?

- ✓ Line departments how much they are willing to offer the service through the system? Might want to disrupt the system for their own personal gain?
- ✓ Do you think the age of government websites has an impact on e-government maturity and sustainability?
- ✓ Do you think the e-government service is progressing from time to time depending on the age of the website? Can you mention some of the growth levels from start time up to now?
- ✓ What do you think about using decentralized e-government? Does it have an effect on maturity and sustainability?
- ✓ What is the contribution of the digital divide in a country? What kind of impact does it have on the maturity and sustainability of e-government? How does it affect your organization's e-government services?
- ✓ What is the role of detailed assimilation processes on the implementation of e-government service does it affect the maturity and sustainability of e-government? How does it affect your organization?

Section 5: Understanding the Institutional factors that determine the e-government maturity and how it affects the sustainability of e-government service.

- ✓ What is the impact of Institutional instability and setup in a country on the strength and sustainability of the organization? Does it have an effect on e-government maturity and sustainability?
- ✓ Do you think high customer contact companies have more matured e-government service than low customer Contact companies? (Frequency/type of customer contact has an effect on e-government maturity and sustainability?) Why?
- ✓ Is your organization big/small in view of using e-government services? Why?

Section 6: Understanding the Cultural factors that determine the e-government maturity and how it affects the sustainability of e-government service.

- ✓ What do you think about organizational culture (value, belief, and working together to establish e-government)? Does it have an impact on e-government maturity and sustainability? Explain it in your organization context?

- ✓ Do you know another country /organization that has good organizational culture? Do you think a cultural revolution in the organization has an impact on the maturity and sustainability of the e-government service? Is there any obstacle to adopting good culture in your organization?

- ✓ Are there any other issues that can affect e-government maturity that has not been included in this interview and that you wish to get to my consideration?
- ✓ Please provide any additional information that you think would be helpful in my study?

Appendix B: Table 2. 1: Maturity models' stage names

Stage / Model	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Layne and Lee (2001)	Catalogue	Transaction	Vertical integration	Horizontal integration	X	X
Andersen and Henriksen (2006)	Cultivation	Extension	Maturity	Revolution	X	X
United Nation (2012)	Emerging information services	Enhanced information services	Transactional services	Connected services	X	X
Alhomod et al. (2012)	Presence on the web	Interaction between the citizen and the government	Complete transaction over the web	Integration of services	X	X
Hiller and Belanger (2001)	Information	Two-wa communicat ion	Transaction	Integration	Participati on	X
Almazan and Gil-Garcia (2008)	Presence	Information	Interaction	Transaction	Integratio n	Political Particip ation
Cisco (2007)	Information interaction	Transaction efficiency	Citizen-centric	X	X	X
Gartner group (2000)	Web presence	Interaction	Transaction	Transformatio n	X	X
West (2004)	Bill-board	Partial-service delivery	Portal	Interactive democracy	X	X
Moon (2002)	Simple information disseminatio n	Two-way communicat ion	Service and financial transactions	Integration	Political participati on	X
World Bank (2003)	Publish	Interact	Transact	X	X	X
Deloitte and Touche (2000)	Information publishin	Official-two way transactions	Multipurpose portals	Portal personalizatio n	Clustering of common services	Full integrati on and enterpris e transacti on

Stage / Model	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Howard (2001)	Publish	Interact	Transact	X	X	X
Shahkooh et al. (2008)	Online presence	Interaction	Transaction	Fully integrated and transformed egovernmen	Digital democrac y	X
Lee and Kwak (2012)	Initial conditions	Data transparenc y	Open participation	Open collaboration	Ubiquitou s engageme nt	X
Siau and Long (2005)	Web presence	Interaction	Transaction	Transformatio n	E-democrac y	X
Wescott (2001)	Setting up an email system and internal network	Enabling inter-organizational and public access to information	Allowing 2-way communicatio n	Exchange of value	Digital democrac y	Joined-up govern ment
Chandler and Emanuel (2002)	Information	Interaction	Transaction	Integration	X	X
Kim and Grant (2010)	Web presence	Interaction	Transaction	Integration	Continuou s improvem ent	X
Chen et al. (2011)	Catalogue	Transaction	Vertical integration	X	X	X
Windley (2002)	Simple Web site	Online government	Integrated government	Transformed government	X	X
Reddick (2004)	Cataloguing	Transaction s	X	X	X	X
Accenture (2003)	Online presence	Basic capability	Service availability	Mature delivery	Service transforma tion	X

Stage / Model	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
The UK National Audit (2012)	Basic site	Electronic publishing	E-publishing	Transactional	Joined-up e-governance	X

Source: Fath-Allah et al., 2014

Appendix C: Coding and Themes

	Coding data into themes	Codes
Economic	The government provided the required budget for the development of e-services to MinT, and then MinT and Perago came to an agreement to establish e-services that all government institutions have been able to utilize for free	provided the required budget/ development of e-services/ utilize for free /Financial management
	The service is developed by the government and the institutions that use it do not charge any fees	developed by the government / not charge any fees /Financial management
	Despite the fact that organizations do not allocate budget specifically for the development of e-services, all organizations have well-organized financial management in order to achieve their organizational goal. Some organizations allocate better budget for the development of technology	not allocate budget/ have no well-organized financial management / achieve organizational goal / allocate better budget /Financial management
	Because of the budget they allocate, some organizations have strong infrastructure such as computers, networks, high bandwidth connections, tablets, and wireless devices. Even when they travel to the field, they can access the e-service. E-service will have a higher chance of growing in such institutions and exist for a long time	budget they allocate/ strong infrastructure/ high bandwidth connections/ higher chance of growing/ exist for a long time/ Financial management
	Each organization has its own ICT department with its own budget. However, most organizations ICT department is organized as a support team not as a core due to that the budget is very few. It is not enough to develop a system like e-government because of this they depend on external assistance.	ICT department / budget. / Organized as a support team / not as a core / budget is very few / depend on external assistance.
	There is an organized IT team in some organizations, but not in the other organizations.	organized IT team/ Availability of an ICT department with an independent annual budget e-government development

Coding data into themes	Codes
If the ICT department is independent and core in each institution, its e-service can grow. Because if it has strong ICT department in terms of budget and skill It can use state of the art technology for the infrastructure and network, high band width internet capacity and also have skilled (knowledgeable) IT team members	independent and core / strong ICT department / budget and skill / state of the art technology for the infrastructure / high band width have skilled (knowledgeable) IT team members /Availability of an ICT department with an independent annual budget e-government development/ can grow
We do not have a well-organized and well-trained IT Directorate as an organization, but we do have a support staff with a small number of professionals. I believe that if the consultant is completed on time, the service's sustainability may be endangered	not have a well-organized/ well-trained IT Directorate/ support staff/ consultant is completed on time/ sustainability may be endangered/Availability of an ICT department with an independent annual budget e-government development
I think that the lack of a strong ICT department and a responsible body has hindered the service's ability to mature.	lack of a strong ICT department/ hindered the service's ability to mature
The ICT department is structured as a team and lacks enough budget. Because there aren't enough specialists on the team, they usually do support work like maintenance, which limits their ability to own and manage systems like e-service, both monetarily and in terms of knowledge. We normally contact the consultant to settle any issues we have with the service. An organized ICT department is essential to meet this duty.	structured as a team / lacks enough budget / aren't enough specialists / limits their ability / contact the consultant / to settle any issues Availability of an ICT/ essential to meet this duty department with an independent annual budget e-government development
I think if we had external assistance to implement E-service, it would be better in terms of budget and knowledge transfer,	Independent from external assistance/ better in terms of

	Coding data into themes	Codes
	because in most of the government institutions there are no qualified ICT professionals, there is no knowledge to develop E-service and the budget allocated to the department also very little so it can be difficult to develop. It is also important to enable the staff in the institute to manage the e-service on their own, as it may not be sustainable	budget/ knowledge transfer/ no qualified ICT professionals/ difficult to develop/ also important to enable the staff/ may not be sustainable
	Working with a consultant to develop an e-service has a positive impact because it can take a long time if we try to do it ourselves because we lack the necessary knowledge and experience. When we work with a consultant, the professionals in the institution gain valuable experience in the process.	Independent from external assistance/ Working with a consultant/ take a long time/ lack the necessary knowledge and experience/ valuable experience/sustainable
	External assistance is necessary to our organization because it is difficult to develop e-service by our professionals. However, they have to own the e- service and manage after implementation by transferring knowledge from the consultants.	Independent from external assistance/ necessary to our organization/ difficult to develop/ manage after implementation/ transferring knowledge
Social	Human resource capability is critical for the service's growth since educated individuals can readily understand it, however older professionals may find it difficult to interact with the service because they don't understand new technology and may be hesitant to continue working in the service. They want to continue with the existing service delivery or manual approach for these reasons.	Human resource capability/human and intellectual capability/ critical for the service's growth/ difficult to interact/ don't understand new technology/ continue with the existing/ manual approach
	The service provider / case worker's IT skills at different times may vary according to the experts, which may depend on age and level of education in terms of understanding the service. Although some experts are trained frequently, they may not easily understand the service.	Human resource capability/human and intellectual capability/ IT skills/ depend on age/ level of education/ understanding the service/ trained frequently/ not easily understand

Coding data into themes	Codes
I think the human literacy level has a huge impact on the maturity and sustainability of the service because even in one institution a well-educated workforce can understand and continue the service, while in low-skilled departments the service goes back to manual without understanding. This makes the e-service not fully functional	Human resource capability/human and intellectual capability/ literacy level/ huge impact on the maturity and sustainability/ not fully functional
Experts who work in e-services are all educated with at least a bachelor's degree and have no difficulty to understand the service and providing services. Sometimes one expert shares his knowledge and experience for the other experts this make easy to understood and work together, even when face challenge more than our capacity we ask support from consultants because of this reason, the service delivery mechanism grew up.	Human resource capability/human and intellectual capability/ educated/ share his knowledge and experience/ face challenge/ ask support from consultants/ service delivery mechanism grew up.
The fact that many professionals are educated and can easily comprehend and utilize the e-service is one of the reasons for its long-term sustainability, and the major one is the leader's high degree of engagement. This is due to the fact that this institution's e-service was launched during the Covid 19 time, and they were required to do so in order to reduce client contact	Human resource capability/human and intellectual capability/ educated and can easily comprehend and utilize/ long-term sustainability/ leader's high degree of engagement/ launched during the Covid 19
In most organizations IT experts do not have enough knowledge on the area. Due to such reason, continuous training must be given. However, in some cases, the trainees who are selected for the training by the institution do not work in the right place and the trained ones do not work after the training too since there is high staff turnover	high Staff turnover / not have enough knowledge/ not work in the right place/ not work after the training/
Staff turnover has a substantial influence on e-service maturity because it puts a load on other experts, causing them to get focused with daily tasks rather than trying to enhance the service	Staff turnover / substantial influence on maturity / puts a load on other experts/ focused with daily tasks/ trying to enhance the service

Coding data into themes	Codes
The staff who are hired in the organization do not leave us often, and the professionals who are working on the e-service are constantly gaining experience, which has contributed to the growth of the service and has made the service delivery more matured and that helps to sustainable.	**Low Staff turnover** / constantly gaining experience/ contributed to the growth/ more matured and that helps to sustainable.
I think if the e-service could have been developed by the organizations it uses, it would have been able to fully meet the requirement, rather than being developed by another organization, but our organizations own the e-service that are developed by external assistance we take all the responsibility and manage the system properly this makes our e- service sustainable	Develop senses of ownership/ fully meet the requirement/ own the e-service/ makes our e-service sustainable
Some institutions use it on their own and do not seek support unless they have a critical issue.	Develop senses of ownership/ do not seek support/ e- service sustainable
The existence of a manager's dedication in our organization helps us to rapidly address issues.	Manager's commitment to prioritize e-government projects/ manager's dedication/ helps us to rapidly address issues/
He doesn't feel that managers are extremely dedicated because the majority of them have limited experience in the area and are just forced to do things by regulation.	Manager's commitment to prioritize e-government projects/ don't feel that managers are extremely dedicated/ limited experience in the area/ forced to do things by regulation
I have doubt on managers commitment to use e-service by giving priority than other projects because they didn't understand the benefit and also, they don't have knowledge I need a leader who have to know the service more than or equal to experts. There are things to be started but no one is committed to implement it.	Manager's commitment to prioritize e-government projects/ doubt on managers commitment/ giving priority/ didn't understand the benefit/ no one is committed

Coding data into themes	Codes
The key reason for our success, in my opinion, is that each employee in our company has made a personal commitment to accomplish our job using e-services, and that our ICT department has taken the lead in making the e-services sustainable.	Manager's commitment to prioritize e-government projects/ key reason for our success/ made a personal commitment/ e-services sustainable.
I think individual commitment has a very high contribution to mature and sustain the e-service because some of the professionals we have helped to keep the system afloat so far have been committed to supporting it and being able to take responsibility for fixing it when it is broken. Every professional commitment, even if there are problems, can withstand that and grow the service.	Manager's commitment to prioritize e-government projects/ individual commitment/ high contribution to mature and sustain/
Some organizations, have regular rotations of staff due to the nature of their work. Working in same position by rotation is always able to provide on-the-job training by their own professionals. Because he was able to show it to the oncoming professional.	Management of human resources competencies/ regular rotations of staff/ on-the-job training
Training is always provided before the lunching of implementation of the system. The training is also provided to the newcomers when the previous employee was released. The training will be given if required by the institute or when necessary, based on assessment, yet request for taking of the training come from the trainee themselves that was more fruitful than other means.	Management of human resources competencies/ before the lunching/ training is also provided to the newcomers/
Case workers misunderstanding of training that was given to them, results in difficulty of translating into practice, some experts are not active to accept the technology as well as Inadequate training was granted to them and Lack of qualified IT professional	Management of human resources competencies/ misunderstanding training/ difficulty to translating into practice/ not active to accept the technology/ Inadequate training was granted to them/ Lack of qualified IT professional

Coding data into themes	Codes
We didn't receive regular training, after the implementation it was given to all the professionals once, I think this is enough.	Management of human resources competencies/ didn't receive regular training/ given to all the professionals once/ enough
The expert's does not receive a salary increment or special reward for working for the e-service. He or she will only benefit from using the service as it will reduce the previous workload and therefore will not be willing to work under the manual system of course, the working hours are higher than the manual, yet it also reduces the professional performance, further it also increases the interest of working environment.	Management of human resources competencies/ not receive a salary increment or special reward/ only benefit from using the service/ not be willing to work/ reduces the professional performance/ increases the interest of working environment
Most of the customers complained that they did not understand the usage and that they did not receive any documents from the institution	Citizenship communication management/ not understand the usage/ not receive any documents
I think citizens do not have confidence in the e-service because most of the time people do not seem to be willing to use it on their own initiative unless they are told to go and provide this service.	Citizenship communication management/ do not have confidence /not seem to be willing
Another purpose of e-service is to windup the connection between service giver and client, which eliminates corruption and gives citizens confidence in e-service.	Citizenship communication management/ eliminates corruption/ gives citizens confidence
Customers have confidence in the system but in our side, we do not trust e-service because we are sure that the files we save will not be lost unless there is an accident. The system did not have bake up when the system down we lost data's that was done for the last a month.	Citizenship communication management/ not trust/ not be lost
Without a Citizen Request, no matter what service we have, it will not be sustainable	Citizenship communication management/ not be sustainable

Coding data into themes	Codes
High customer contact companies have more matured e-services because such companies have high work load due to that it is better to use e-service than the manual system	Degree and frequency of customer contacts/ High customer contact/ more matured/ better to use
I think customer contact didn't have an impact on e-service maturity. I think it varies according to the capacity of the organization, so for me even though they have high / low customer both are the same.	Degree and frequency of customer contacts/ didn't have an impact on e-service maturity/ have high / low customer both are the same.
With over 100,000 customers, we are able to provide a more involved and long-term service.	Degree and frequency of customer contacts/ to provide a more involved and long-term service.
The system will go down or fail if the frequency of customer contact is too high since the infrastructure does not have the ability to handle a large number of clients.	Degree and frequency of customer contacts/ go down or fail/ not have the ability to handle a large number of clients
The level of public awareness creation is insufficient, but she is familiar with the experience of creating advertisements on television in the past, which she believes it hinders the service's growth.	Awareness and Trust among Citizens/ experience of creating advertisements/ hinders the service's growth.
We try to create awareness by doing different promotions on different media like TV and on ICT expo but it is not enough.	Awareness and Trust among Citizens/ not enough
Use a variety of methods to raise awareness, such as printing booklets, putting on bulletin boards, and using digital signage, and we believe they are fully aware of this. They putting advertisements on the organization notice board, television advertisements are made, and they believe that everyone is aware that they should apply using the e-service before going to the organization.	Awareness and Trust among Citizens/ Use a variety of methods to raise awareness/ believe they are fully aware

Coding data into themes	Codes
Even though there have been attempts to raise awareness, but they don't believe that they are adequate.	Awareness and Trust among Citizens/ don't believe they are adequate
Due to the reason that we didn't create awareness on the citizens we are creating a citizen who does not want to get online service. Because most customer know about the e-service after they go to the organizations physically and once, they reach, they want to get the service manually this affects the sustainability of the service.	Awareness and Trust among Citizens/ does not want to get online service/ go to the organizations physically/ want to get the service manually/ affect the sustainability
Customers are complaining because the e-service is still not satisfactory. It can only grow if this is addressed; else, it may be compromised.	Customer satisfaction/ Customers are complaining/ e-service is still not satisfactory
Some customers complain about a lack of access to technology, while others complain about network outages, and some customers want to come physically and go as quickly as possible.	Customer satisfaction/ a lack of access to technology/ complain about network outages/ want to come physically
Because our client group ranges from grade 4 to PhD, they have not internalized the e-service. As a result, the majority of customers find the e-service difficult to understand and utilize.	Customer satisfaction/ not internalized the e-service/ difficult to understand and utilize
Documents that are changed during online renewal will be provided to the customer's email address, and they will print the document on a single sheet of paper in black and white. It is difficult to use, causing the client to be dissatisfied with the service.	Customer satisfaction/ difficult to use/ dissatisfied with the service.
While I didn't have research base data on customer satisfaction, most customers complain. They find it difficult to register using the service. Even though procedure is posted everywhere in, our offices but they are difficult to understand so they went to internet café to apply.	Customer satisfaction/ didn't have research base data/ internet café to apply.

	Coding data into themes	Codes
Technological	When the e-service was launched, it used woreda net. Currently, the number of e-service given was increased, yet the capacity of the system is very slow. Therefore, Institutions were started to use internet. Using internet somehow transform the e-service granting mechanism but still there is network connection problem. Infrastructure incompetence can be seen from the host system and it is difficult to install additional services due to lack of sufficient server to install services and also needs to have a backup server. Additionally due to lack of internet capacity, the service will be interrupted from time to time. These factors prevent the service from growing at the desired level and can be unsustainable. For example, some companies have multiple services and have signed up and customized an MOU and go to portal they may not be able to enter the rest of the services when they see the employee and the customer struggling because of the infrastructure and internet bandwidth problems. Institutions do not have their own data center for this purpose, decentralizing is difficult in terms of cost and management.	ICT infrastructure development/ the system is very slow/ network connection problem/ Infrastructure incompetence can be seen/ difficult to install additional services/ lack of sufficient server to install services/ lack of internet capacity/ interrupted from time to time/ prevent the service from growing/
	Infrastructure is currently a major problem and work is underway to address this. • Internet capacity is improving, but it is still lacking Computer was not sufficiently accessible to all employees • Network and internet connection problem	ICT infrastructure development/ Internet capacity is improving/ Computer was not sufficiently accessible/ Network and internet connection problem
	Infrastructure and service incompatibility is one of the issues. At the national level, there is an infrastructure problem. We do not have a qualified data center. All government institutions are building a small data center in a fragmented manner this needs to be amend.	ICT infrastructure development/ Infrastructure and service incompatibility/ not have a qualified data center

Coding data into themes	Codes
There is no ICT infrastructure problem; all specialists have their own computer/laptop, even if it is not the most recent, and a network connection with adequate bandwidth.	ICT infrastructure development/ no ICT infrastructure problem/
Webpage progresses, new services are constantly being added and functionality is improving. Professional experience is also increasing and customer acceptance is constantly increasing which makes the e-service mature and it's going to sustain.	Website age/ services are constantly being added and functionality is improving/ experience is also increasing/ customer acceptance is constantly increasing/ customer acceptance is constantly increasing/ going to sustain.
All respondents conclude that there are an infrastructure problem at national level and this affects the maturity and sustainability of e-service.	Infrastructure management/ infrastructure problem at national level/ affects the maturity and sustainability of e-service.
All the respondents explained that they have not been using state-of the- art technology like cloud this may affect both maturity and sustainability of e-service.	State-of-the-art technology / technology like cloud/ affect both maturity and sustainability
Due to the lack of integration between institutions and services, the process has been difficult and the paperwork has not been fully halted due to such fact employee's performance is decreases. Additionally, on the part of the customer, mode of payment was not integrated with internet so customers pay service fee through bank. It does not wind-up back-and-forth of service delivery. Because this reason the service is not matured and if this continue through time sustainability of the granting e-service is in question.	Integration/ lack of integration between institutions and services/ performance is decreases/ not integrated with internet/ payment was not integrated/ service is not matured/ continue through time sustainability
There is no integration across institutions; rather, work is done by a single institution. This does not imply the provision of a successful independent service. This is because if you go to one institution that has an e-service and another that does not, the user will experience the same thing like manual system, and their	Integration/ no integration across institutions/ not imply the provision of a successful independent service/ halting the development of the e-service.

Coding data into themes	Codes
interest in utilizing it will decline, halting the development of the e-service.	
They submit the necessary documents for renewal and there is no way to verify the authenticity of these documents due to the fact that the service provided by the e-service is not associated with various organizations	Integration/ is no way to verify the authenticity/ not associated with various organizations
There are documents that need to be checked while we are doing the work and the customer has to pay a fee but the e service is not integrated with other institutions which makes our work difficult.	Integration / documents that need to be checked/ customer has to pay a fee/ not integrated with other institutions
Platform development designed for all institutions and allows companies to customize their own business process and it allow them for use. All the respondent mentioned that they can easily customize the services based on the business process they have this makes the service sustainable.	Personalization/ customize their own business process/ makes the service sustainable.
The only Institutions that are willing to use the service enter by checking the e-readiness.	checking e-readiness/ Institutions that are willing to use the service are enter
Before development started, e-readiness tests were conducted, and criteria such as computer and internet connectivity, as well as tablets, were fulfilled	e-readiness tests were conducted
E-readiness of the system were investigated first and foremost. If you know how many people can use a computer, a network, an Internet capital, and how many people can use the e service, the institution will be given priority because the institution that does not meet these requirements will not be able to continue the service. Most of the respondents agreed that, this issue affects the maturity of e-service.	e-readiness/ investigated first and foremost/ affects the maturity of e-service.

	Coding data into themes	Codes
Political	Political environment has an impact on our e-service maturity for Example Network service disconnected in conflict areas in addition when the political environment is changed there is also leaders and policy also change this effect the e-services in the government organization. In such kind of areas, the organizations plan to utilize e-service interrupted because of the conflict occurred.	Political environment/ impact on our e-service maturity/ leaders and policy also change/ organizations plan to utilize e-service interrupted
	Political environment has an impact on the development of services due to the current political crisis in our country. In some places, the Internet was down, and in some cases the network infrastructure was destroyed. As a result, service was disrupted in areas where this problem persisted.	Political environment/ impact on the development of services/ political crisis in our country/ Internet was down/ network infrastructure was destroyed/ service was disrupted
	Political strategies have its own implications, Strong and binding laws in terms of the use of e-services is very important. I think the public and institutions will use the service to a better extent. If such thing are properly used the service delivery will have high rate of sustainability and the public at large feel as they have secured data and the develop trust on the government. This makes the system more matured.	Legal and Political strategies/ Strong and binding laws in terms of the use/ use the service to a better extent/ high rate of sustainability/ have secured data and the develop trust/ system more matured
	Political leaders are constantly changed; therefore, the new one is being influenced by a lack of uniform working procedure, as systems change as people change. This can cause the service to fail. Subsequently, as political leaders change, persuading the next person to re-enter the service can put the service back on track.	Sustaining Political leadership/ constantly changed/ influenced by a lack of uniform working procedure/ political leaders change/ service back on track.
	Political leaders can be change frequently this make the work to start from zero because institutions working processes are determined by the leaders the reason is no permanent system in place.	Sustaining Political leadership/ change frequently/ work to start from zero/ processes are determined by the leaders/ no permanent system in place.

Coding data into themes		Codes
	One of the challenges we face is that the leaders are changed from time to time, and as a result, when you talk about what you are doing and the benefits of the system as whole, leaders are changed again, when you go to work, all the work goes back and forth. Frequent changes in leadership are one of the things that prevent us from doing at our best in the service.	Sustaining Political leadership/ challenges we face is that the leaders' changes/ all the work goes back and forth/ prevent us from doing at our best
	For effective e-government considerations, a clear vision and strategy that guides and supports the whole e-government implementation process and focuses on the fulfillment of specific and well-articulated e-government goals is vital. We are working on a technology-based plan for our organization's vision, mission and strategy. One of them is to use the service to done job, and as a result, the service is constantly growing and sustained	Strategic management/ clear vision and strategy that guides/ focuses on the fulfillment of specific and well-articulated e-government goals/ working on a technology-based plan/ service is constantly growing and sustained
	We plan to integrate technology in our institutional planning operations; therefore, e-service is also included.	Strategic management/ integrate technology in our institutional planning
	There is no vision, mission, or strategy in their organization that includes e-services or other technologies. They didn't put it in their strategy since they thought it was a basic tool that they utilize to conduct our work. In contrast to the one that failed, all of the respondents that have a sustainable e-service indicated they incorporate e-service and other technology in their vision, goal, and strategy.	Strategic management/ no vision, mission, or strategy in their organization / didn't put it in their strategy/ incorporate e-service and other technology in their vision, goal, and strategy
Institutional	Institutional Structure Changes frequently because of this fact, employees are not ready to perform their job the reason is they didn't know who is stay on the position they were exist and also on the same institution. In addition, after we complete to grant training and request experts who participate on training, they do didn't know who is stay because they fear that the trained professional may not be able to work in the next position.	Institutional Instability/ Changes frequently/ not ready to perform their job/ didn't know who is stay/ fear that the trained professional may not be able to work

	Coding data into themes	Codes
	Institutional instability is one of the factors that affect the maturity of e-service. One of the problems they have with some institutions is that when they customize the service and start working, the institution will collapse.	Institutional Instability/ institution will collapse/ affect the maturity
	Some of the factors that impede us from achieving our best in the service include frequent institutional changes.	Institutional Instability/ impede us from achieving our best/ frequent institutional changes
	I think the existence of institutional instability will have a big impact on the growth of the e-service because of the instability of the staff during the shift, the shift of expert's position, the replacement of former employees who took trainings with new one, the need to provide new training to new employees. However, when training is planning to grant it is unknown for whom the training be given. Additionally, despite the right professional who are working in the given position might not be sent to the training also one of the challenges for the development of the system. On the other hand, the newly formed institution is less motivated to use the service.	Institutional Instability/ big impact on the growth/ replacement of former employees/ new training to new employees/ unknown for whom the training/ challenges for the development of the system/ newly formed institution is less motivated to use the service
Cultural	Some organizations have a good work ethic, working together as a team, and work during rest time, and this culture has made the service sustainable.	Cultural management/ good work ethic/ working together as a team/ work during rest time/ made the service sustainable.
	Organizational culture has an impact on the maturity of the e-serves due to the reason that organization which have good culture can easily accept the service and use effectively.	Cultural management/ good culture/ easily accept the service/ use effectively/impact on the maturity
	It is not difficult to launch e-services in organizations with a good working culture. It makes it easier for them to cope with problems and sustain it.	Cultural management/ not difficult to launch/ good working culture/ easier for them to cope with problems / sustain.

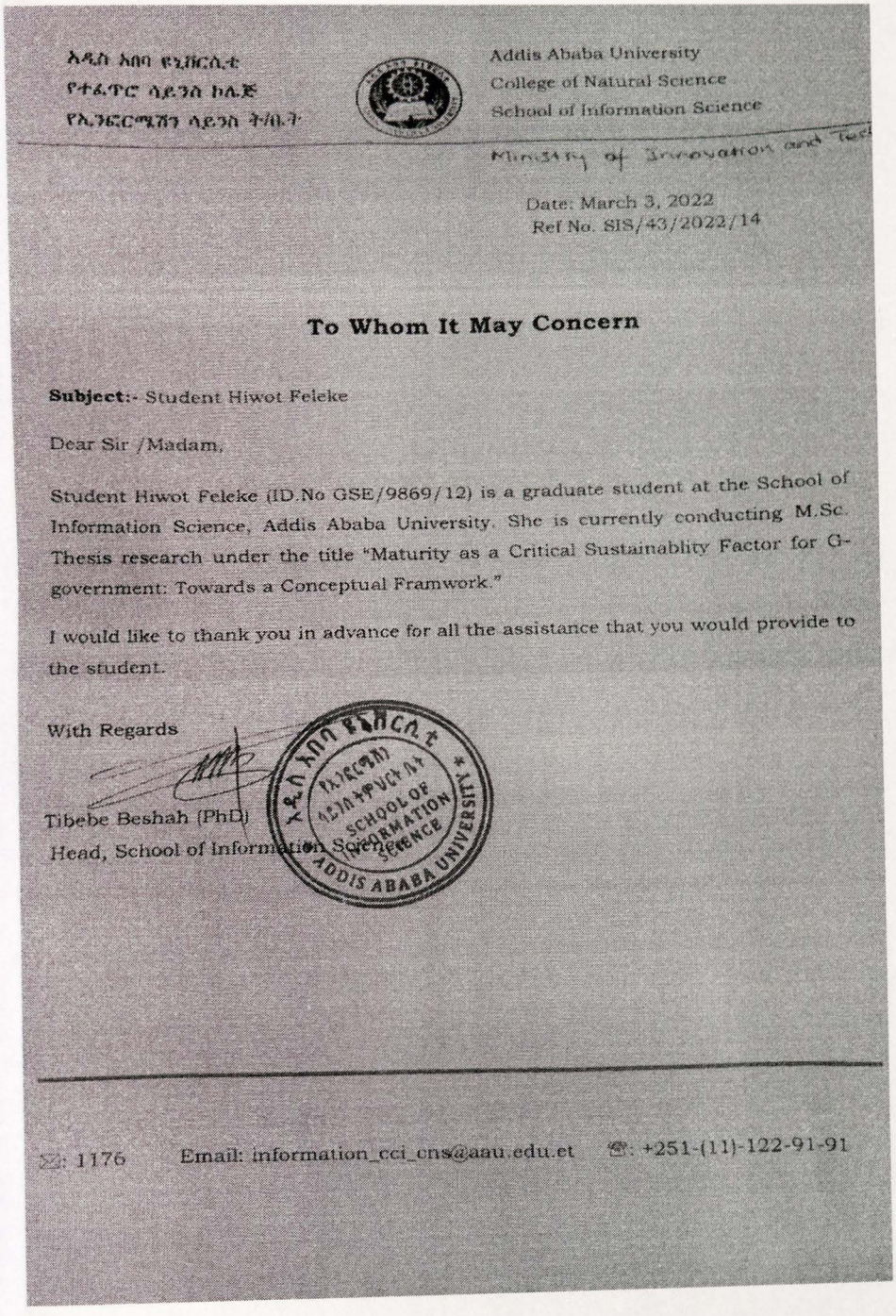
	Coding data into themes	Codes
	We do our job as a team and also have an excellent working culture, which allows us to execute our tasks more efficiently by utilizing the e-service and sharing our knowledge	Cultural management/ do our job as a team/ excellent working culture/ allows us to execute our tasks more efficiently/ utilizing the e-service/ sharing our knowledge
	I believe that e-service may strengthen our organization's work ethic since the task allocated to a person must be completed independently, which promotes accountability.	Cultural management/ strengthen our organization's work ethic / completed independently/ promotes accountability.
	During the pick-up time at our institution, employees required to join on their weekend's time and work what is assigned for I think this is our best experience that we can share for others.	Cultural management/ required to join on their weekend's time
	We have a positive work environment and are dedicated to completing our tasks. The expert also works on weekends to keep the service operational by using the e-service this makes our service sustainable.	Cultural management/ positive work environment/ works on weekends/ makes our service sustainable.

Appendix D: Key for Figure 4.1. Revised Conceptual Framework that show the relationship between maturity and sustainability

Key for diagram that shows the relationship between maturity and sustainability determinants	
1. Availability of an ICT department with an independent annual budget for e-government development	❖ Infrastructure management
	❖ Independent from external assistance
	❖ State-of-The-Art Technology
	❖ Develop senses of ownership
2. Human resource capability/ human and intellectual capability	❖ Develop senses of ownership
	❖ Management of human resources competencies
3. Staff Retention	❖ Independent from external assistance
	❖ Develop senses of ownership
	❖ Management of human resources competencies
4. Manager's commitment to prioritize e-government projects	❖ Independent from external assistance
	❖ Awareness and Trust among Citizens
	❖ Infrastructure management
	❖ Change in culture
5. Degree and frequency of customer contacts	❖ Awareness and Trust among Citizens
	❖ Infrastructure management
6. Customer satisfaction	❖ Citizenship communication management
	❖ Service provision management

. ICT infrastructure Development	❖ Infrastructure management
	❖ Electronic information management
	❖ Agile Accessibility
	❖ Streamlined Services
	❖ E-citizenship readiness
3. Integration	❖ Streamlined Services
	❖ E-citizenship readiness
9. Website age	❖ Awareness and Trust among Citizens
	❖ Infrastructure management
	❖ Streamlined Services
	❖ State-of-The-Art Technology
10. Legal and Political Strategies	❖ Legal requirement
11. Institutional Instability	❖ Long term vision
	❖ Management of human resources competencies
	❖ Develop senses of ownership
12. Organizational e-government operational plan	❖ Long term vision
	❖ Strategic management
13. Political environment	❖ Long term vision
	❖ Sustaining Political leadership
	❖ Legal requirement
	❖ Infrastructure management
14. E-Payments	❖ Financial management

Appendix E: Support Letters to Concerned E-Service Implementer Organzations



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Addis Ababa University
College of Natural Science
School of Information Science

Ministry of Innovation and Tec

Date: March 3, 2022
Ref No. SIS/43/2022/14

To Whom It May Concern

Subject:- Student Hiwot Feleke

Dear Sir /Madam,

Student Hiwot Feleke (ID.No GSE/9869/12) is a graduate student at the School of Information Science, Addis Ababa University. She is currently conducting M.Sc. Thesis research under the title "Maturity as a Critical Sustainablity Factor for G-government: Towards a Conceptual Framwork."

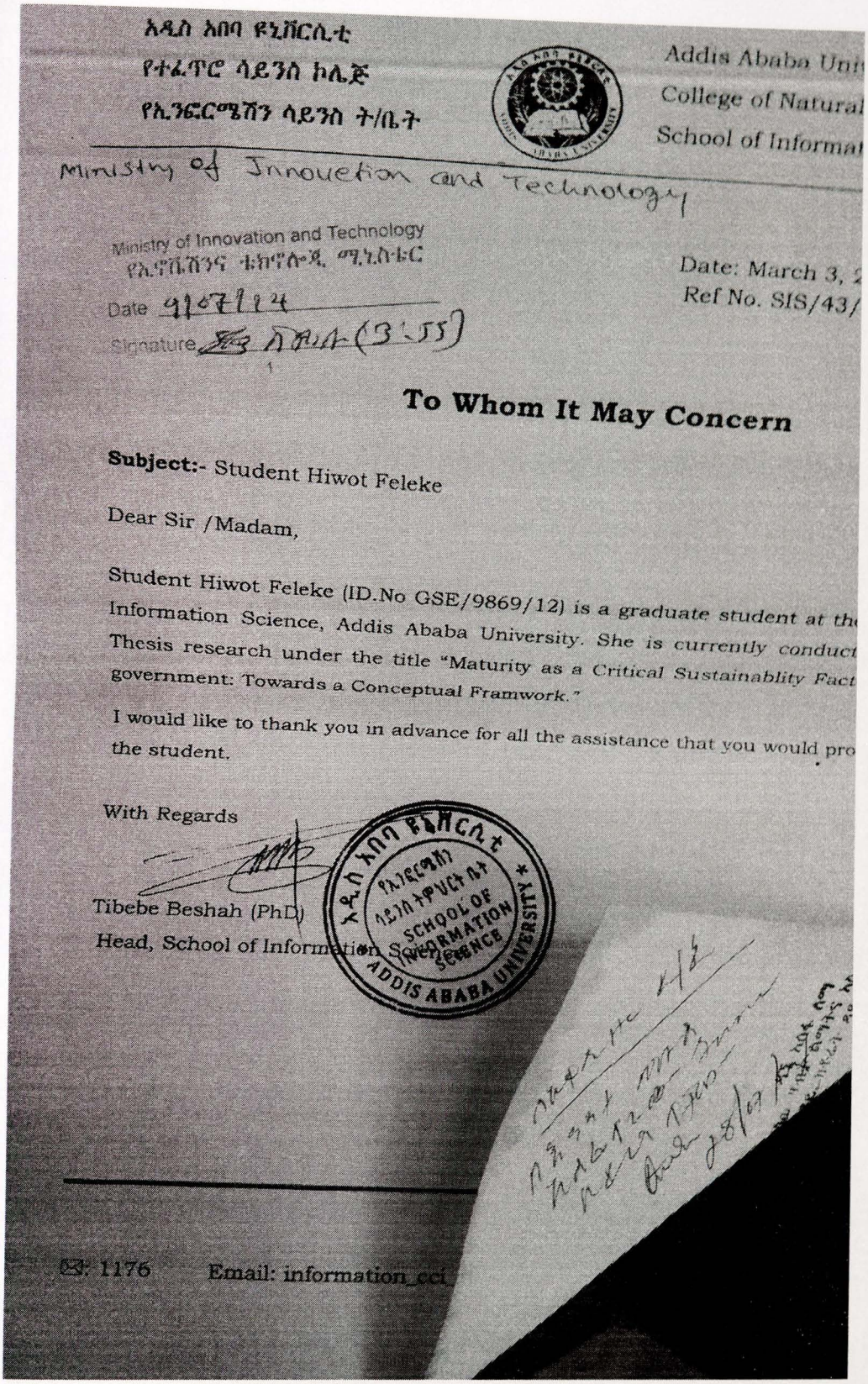
I would like to thank you in advance for all the assistance that you would provide to the student.

With Regards

Tibebe Beshah (PhD)
Head, School of Information Science

ADDIS ABABA UNIVERSITY SCHOOL OF INFORMATION SCIENCE

✉: 1176 Email: information_cci_cns@aau.edu.et ☎: +251-(11)-122-91-91



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Addis Ababa Uni
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School of Informat

Ministry of Innovation and Technology

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Date 9/07/12
Signature

Date: March 3, 2
Ref No. SIS/43/

To Whom It May Concern

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Dear Sir /Madam,

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I would like to thank you in advance for all the assistance that you would pro
the student.

With Regards

Tibebe Beshah (PhD)
Head, School of Information Science

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The Federal Democratic Republic of Ethiopia
Ministry of Innovation and Technology

MInT

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Ref.No. [illegible]
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Date - 8 APR 2022

To: Ethiopian Construction Authority

Re: Request to conduct research

As per the letter of request on March 3, 2022, I hereby confirm that Hiwot Feleke is allowed to collect data for research purposes on four organizations which gives their services through the portal by support of Ministry of Innovation and Technology. The study will focus on maturity and sustainability of e-services on the e-government portal of Ethiopia. The title of the study is "Maturity as a Critical Sustainability Factor for E-government: Towards a Conceptual Framework ".

Therefor I would like to thanks you in advance for all the assistance you provide her.

With kind regards

YONAS HAILU
GOVERNMENT ICT NETWORK
DEV & ADMIN DIRECTORATE DIRECTOR

The Federal Democratic Republic of Ethiopia Ministry of Innovation and Technology

CC: Hiwot Feleke

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ከአርምጃ ወደ ፋጫ
From Faciltator to Main Actor

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The Federal Democratic Republic of Ethiopia
Ministry of Innovation and Technology

MInT

ቁጥር
Ref.No ኢን/ሄ/ሄ/157/14
ቀን
Date - 8 APR 2022

To: Accounting and Auditing Board of Ethiopia

Re: Request to conduct research

As per the letter of request on March 3, 2022, I hereby confirm that Hiwot Feleke is allowed to collect data for research purposes on four organizations which gives their services through the portal by support of Ministry of Innovation and Technology. The study will focus on maturity and sustainability of e-services on the e-government portal of Ethiopia. The title of the study is "Maturity as a Critical Sustainability Factor for E-government: Towards a Conceptual Framework ".

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With kind regards

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The Federal Democratic Republic of Ethiopia
Ministry of Innovation and Technology

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ቁጥር
Ref.No. [illegible]
ቀን
Date - 8 APR 2022

To: Federal Attorney General

Re: Request to conduct research

As per the letter of request on March 3, 2022, I hereby confirm that Hiwot Feleke is allowed to collect data for research purposes on four organizations which gives their services through the portal by support of Ministry of Innovation and Technology. The study will focus on maturity and sustainability of e-services on the e-government portal of Ethiopia. The title of the study is "Maturity as a Critical Sustainability Factor for E-government: Towards a Conceptual Framework ".

Therefor I would like to thanks you in advance for all the assistance you provide her.

With kind regards

YONAS HAILU
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