American University in Cairo

AUC Knowledge Fountain

Theses and Dissertations

2-1-2020

E-governance for sustainable development in Ghana: Issues and prospects.

Gabriel Sadat Alhassan

Follow this and additional works at: https://fount.aucegypt.edu/etds

Recommended Citation

APA Citation

Alhassan, G. (2020). *E-governance for sustainable development in Ghana: Issues and prospects.* [Master's thesis, the American University in Cairo]. AUC Knowledge Fountain.
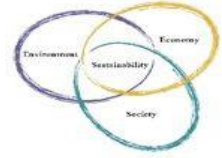https://fount.aucegypt.edu/etds/814

MLA Citation

Alhassan, Gabriel Sadat. *E-governance for sustainable development in Ghana: Issues and prospects..*
2020. American University in Cairo, Master's thesis. *AUC Knowledge Fountain*.
https://fount.aucegypt.edu/etds/814

THE AMERICAN UNIVERSITY IN CAIRO
الجـامـعـة الأمـريكيـة بالقـاهـرة

E-governance for Sustainable Development in Ghana: Issues and Prospects

A Thesis Submitted to Graduate Program in Sustainable Development

in partial fulfillment of the requirements for the

Degree of Master of Science in

Sustainable Development

Submitted by:

Gabriel Sadat Alhassan

Under the supervision of:

Dr. Khaled Abdelhalim

Assistant Professor of Urban Policy

Department of Public Policy and Administration

The American University in Cairo

Fall 2019

Acknowledgments

I am grateful to God almighty for seeing me through my master's degree successfully. All that I am and could ever be is owed to him.

I would like to gratefully and sincerely thank my supervisor, Dr. Khaled Abdelhalim, whose mentorship and guidance saw me through my coursework and this thesis.

I would like to register my profound appreciation to Dr. Charles Kaye-Essien, who was always on hand to critique and offer critical feedback on my work. I know I shall continue to learn and grow under your guidance.

Special thanks to Dr. Shahjahan for his insights and academic resources, which have impacted the quality of this thesis positively.

To my brother, Majeed Alhassan, I say God bless you richly; my stay in Cairo would not have been possible without your support.

To my friend and partner in crime, Najla'a D. Mohamed Ali, I treasure our time together, and the memories will forever be engraved on my heart.

To Zephaniah K. Danaa, Amedzo Y. Mensah, Adam Yousif Adam, and Yussif Adams Khalifa, I acknowledge the brotherly support and positive affirmation from you guys with a heart filled with gratitude. May the bonds of friendship never break.

I would like to place on record my warmest love and appreciation to my family for their prayers, sacrifices, and criticisms. Their faith in me propels me towards excellence.

Abstract

Electronic governance and sustainable development have attracted considerable scholarly attention in recent times. However, the relationship between the two concepts has not been sufficiently explored within the academic community in Ghana.

This study explores the current state of e-governance and how it is perceived to be related to the concept of sustainable development and its application in Ghana. It brings to the forefront the topical issue of sustainability and how it can be achieved through systems thinking. The aim of this study was to explore the nexus between e-governance and sustainable development, the contribution of e-governance to sustainable development and the measures to increase the adoption of e-governance in Ghana.

This study employed a mixed-method research design to achieve its objectives. Focus group discussions and questionnaires were the principal data collection instruments alongside secondary data. Per the research findings, there is a strong relationship between e-governance and sustainable development. The study further established that the deployment of e-government projects have a direct impact on the three pillars of sustainable development; economic, social, and environment.

From the study, e-governance ensures the delivery of services remotely, thereby reducing the economic, social and environmental costs associated with service delivery to the public. It cuts down on the use of resources and empowers consumers to seek and receive services around the clock.

This study recommends that e-governance should be a vital tool for sustainable development and that for developing countries to realize the full benefits of e-governance, the two concepts should be pursued in simultaneity.

Keywords: Electronic governance, Sustainable development, ICT, Ghana.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

CSSPS:	Computerized School Selection and Placement System
DFID:	United Kingdom Department for International Development
EGOV4SD:	E-governance and sustainable development
E-government:	Electronic government
EU:	European Union
FGD:	Focus Group Discussion
FGDs:	Focus Group Discussions
G2B:	Government-to-Business
G2C:	Government-to-Citizens
G2E:	Government-to-Employees
G2G:	Government-to-Government
GCNet:	Ghana Community Network
GHGs:	Greenhouse Gas
GIFMIS:	Ghana Integrated Financial Management Information System
GSGDA:	The Ghana Shared Growth and Development Agenda
ICT:	Information and Communications Technology
ICT4AD:	Accelerated Development
IDA:	International Development Association
IMF:	International Monetary Fund
MDAs:	Ministries, Departments and Agencies
MMDAs:	Metropolitan, Municipal and District Assemblies
NITA:	National Information Technology Agency
PPP:	Public-Private Partnership
SMART:	Simple, Moral, Accountable, Responsive and Transparent
SPSS:	Statistical Package for the Social Sciences
UNCED:	United Nations Conference on Environment and Development
UNCED:	United Nations Conference on Environment and Development
WCED:	World Commission on Environment and Development
WWW:	World Wide Web

1.1 CHAPTER ONE: INTRODUCTION

The advent of the internet and the World Wide Web (www) has propelled disruptive changes in all facets of modern life. The allure of the internet has led to its wide-scale adoption in the delivery of services across all sectors of society. The 1990s ushered in a period where digital infrastructure became user-friendly, affordable, and available. Governments, therefore, started to employ Information and Communications Technology (ICT) in the performance of elemental administrative functions like strategic planning, statistics, finance, and legal registers. The creation of this vast digital network has been enabled by advancements in the field of ICT, has become an integral part of modern democracies and public administration and has been globally acknowledged as a prerequisite for good governance (Verkijika, & De Wet, 2018; Veit & Huntgeburth, 2014). Businesses and citizens have invested in digital transformation in the twenty-first century leading to an increase in online content. Fortunately, with the availability of modern technologies at affordable rates and the increasing internet access, the use of electronic systems for public service delivery is becoming an inevitable feature of modern societies (Rana et al., 2017; Mayer-Schönberger, 2007; Zhang et al., 2014). One of the sectors where the deployment of ICT is gaining significant grounds is in national governance (E-governance).

The adoption of digital technologies in national governance creates a platform for the implementation of "higher quality, cost effective government services and a better relationship between citizens and government" (Fang, 2002, p. 2). Using ICT in governance has the potential of being an enabler of citizen participation (e-participation) in the governance process of a nation, thereby contributing towards the good governance agenda. E-governance benefits the government as a unit, parastatal, and public agencies, as well as the public. It unifies the various operations of the government into a cohesive and complementary whole, which can be a useful cost-saving tool. Such an integrated system within government bureaucracy also leads to better time management and enhanced efficiency owing to the syncing of shared data. This results in timeous and better decision making as it "saves the time, reduces the number of human forces and the costs of exchanges, facilitates the communications with users, and reduces other operating costs" (Mahmoodi, & Nojedeh, 2016, p. 141). The use of digital innovations in governance revolutionizes how new services are accessed and enhances the delivery of "existing services through cheaper ICT-based channels of distribution or by complementing existing services with added e-features" (Centeno, Van & Burgelman, 2005, p. 59). Harnessing the potential of ICT in governance is gaining traction and has become one of the pillars on which countries are assessed for their sustainability.

The transition of Ghana to a lower middle-income country has been achieved through various reforms that have inured to the benefit of the populace. The need to continuously deliver government services with enhanced efficiency and to raise citizens' satisfaction has informed the adoption of e-governance, albeit on a piecemeal basis. E-governance is becoming a viable alternative to the traditional bureaucratic means of public service delivery as it promotes open governance. It restores "trust, including mobilizing citizens or end-users of public services, involving the private sector and civil society organizations in decision-making processes and including stakeholders of all levels of governments in service delivery, as well as developing strategies to facilitate reform implementation" (OECD, 2016, p. 22).

The glamour of digital technologies in public sector service delivery is noticeable in the increasing number of Ministries, Departments and Agencies (MDAs) and Metropolitan, Municipal and District Assemblies (MMDAs) who are interacting with patrons via multiple online platforms. Most of these MMDAs are either creating new websites or enriching existing content or using social media platforms to boost their online visibility (Owusu-Ansah, 2014; Ghana e-Health Strategy, 2010). Real-time access to information and services and e-participation have been the synergistic effects of this steady transition to e-governance.

1.2 Research Problem

The introduction of ICT in the conduct of government business in both the developing and developed countries enhances efficiency, effectiveness, and transparency. In recent times, many public sector agencies are enhancing their online presence and beginning to interact with the public via websites and social media platforms. ICT and the internet have significantly altered the way many public agencies in the country conduct their business in the public sphere, resulting in improved service quality, accessibility, transparency, and greater citizen satisfaction (Ndou, 2004). Both public and private sector service providers have come to appreciate the crucial role of ICT in facilitating their work of providing excellent services to their stakeholders. To ensure sustainability, some of these agencies have adopted a continuous non-linear innovation model by moving deeper into the use of nontraditional means to interact with the public.

In Ghana, concerted efforts have been made to digitalize (fully or partially) government services to the public. The efforts have culminated in the creation of a government portal (www.ghana.gov.gh) and a host of agency websites all geared towards accelerating Ghana's development. However, the public sector in Ghana has not been proactive in using technology as a catalyst for service delivery and sustainable development. In some developing countries where e-government systems have been deployed, the

systems are not linked to other sectors to ensure integrated development, thereby leading to limited benefits from such investments. Though studies abound as to the experience of other countries, a critical review of the existing literature indicates that precious little studies have been undertaken regarding how e-governance can be a tool for sustainable development (Estevez and Janowski, 2013).

Despite the progress in harnessing the strength of ICT in national governance, there is a gap in the literature concerning a critical study of its relation to Ghana's sustainable development. The significance of this relationship is captured in the report of the UN Expert Group on E-government for sustainable development. It states *inter alia* "E-Government can be an enabler of good governance and help improve transparency, accountability, efficiency and effectiveness of sustainable development efforts, as well as help eliminate red- tape and corruption through informed policies and proactive use of new technologies" (UNDESA, 2015 p. 18). Introducing new technology to an old establishment is usually met with a degree of trepidation and equanimity by the intended users. Perceptions of the usefulness, complexity, and other fears are usually associated with the initial phase e-government projects (Njuru, 2011). This study examines the role of e-governance in promoting sustainable development and how e-governance can be used to facilitate the attainment of Ghana's sustainable development agenda.

1.3 Research Objectives

The overarching objective of this study is to examine how e-governance can be used to advance Ghana's efforts towards sustainable development.

Specific Objectives are to:

1. Assess the nexus between E-governance and sustainable development.
2. Explore how E-governance can promote sustainable development in Ghana.
3. Identify ways of increasing the adoption of e-government services.

1.4 Research Questions

The core question this study seeks to answer is, how far does e-government contribute to sustainable development in Ghana? To appreciate and deal with this challenge, the following secondary research questions are raised in the study:

1. What is Ghana's experience in applying e-governance?
2. Do e-governance applications in Ghana have any contribution or impact on sustainable development parameters?

3. What are the policies and actions that can be taken to improve e-governance contribution to sustainable development?

1.5 Significance of the Study

Though much literature has spelled out the role of good governance in development and how e-governance systems ensure transparency, accountability, efficiency and other tenets of good governance, most of these studies have adopted a silo approach to the study – treating e-governance and sustainable development as stand-alone concepts (Estevez and Janowski, 2013). This leaves a knowledge gap which this research seeks to fill. The study will, therefore, examine the role of e-governance in enhancing sustainable development and consequently seek to understand how such a relationship can contribute to sustainable development in Ghana.

As one of the few studies relating to e-governance in Ghana, this study is expected to highlight the state of e-governance and how it can contribute towards Ghana's sustainable development. The findings from this study can be adapted to suit other developing countries, particularly those in sub-Saharan Africa, who share similar characteristics with Ghana. This study will also assist policymakers in fashioning out policies which ensure that e-governance systems are designed to contribute towards sustainability. This research will also augment the existing body of literature related to e-governance and sustainable development of developing countries and will serve as a basis for further studies in the nascent field of e-governance in developing countries.

1.6 Outline of the Study

This study is in six main parts. Chapter one provides an introduction to the subject under study. Chapter two presents a review of relevant literature for the study, while chapter three explains the methodology employed for obtaining and analyzing the data. The findings of this thesis are presented and discussed in chapter four and five, respectively. The concluding chapter (six) encompasses the conclusions of the study, its limitations, suggestions for future research and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter is organized into three broad sections to review the relevant body of literature related to the objectives of the study and to highlight the similarities and differences among scholars in the field. The purpose of this chapter is to provide essential background knowledge about the research topic and bring to the forefront, the existing knowledge gap, which this study will fill.

Firstly, the review takes a general look at the various meanings ascribed to the concept of e-governance, interactions within the e-government system, service delivery approaches, and the stages of e-government development. Secondly, it examines the development of ICT in Ghana, e-governance in Ghana, the GCNet initiative, e-Ghana project, some e-government services, and Ghana's e-governance ranking. Finally, it focuses on the concept of sustainable development and the triple bottom line (TBL / 3BL) concept.

2.2 Overview of E-governance

E-governance as a concept aims at the integration of ICT into the process of governance to ensure increased, efficient, and cost-effective provision of public services and to also ensure efficient interaction with the public. The use of technology in facilitating engagement with stakeholders is to ensure that the process by which public services are delivered from government to citizens or the business community is Simple, Moral, Accountable, Responsive and Transparent (SMART) (Heeks, 2001). The focus of E-governance is on the utilization of the internet, other web-based technologies, and telecommunications infrastructure for information and communication either within government or with the public.

Mergel and Bretschneider (2013) argue that the adoption of modern technology as the preferred means of communication like social media and mobile phones is altering the channels through which services are sought and delivered. The use of ICT tools, to manage the government's interaction with the public, helps break down traditional barriers of communication leads to shared benefits for the stakeholders involved. Good governance and its virtues are enhanced in the adoption of E-governance as participation, transparency and accountability are made possible due to the availability of digital technologies and electronic applications (Andersen & Henriksen, 2006; Adeyemo, 2011). This view is supported by Chowdhury & Satter (2013), who believe that e-governance opens government offices to the public, thereby leading to transparency and improved exchange of information between the government and the public.

The reliance on the internet for public service delivery is seen in the rising number of online services being rolled out both developed and developing countries. Public institutions are moving from setting up websites to providing basic information to the development and deployment of sophisticated systems for the management of government's internal and external interactions to ensure inclusion, effectiveness, accountability, and transparency (UN Survey, 2016).

E-governance facilitates interaction on two broad levels, external and internal. First, it refers to the use of electronic communication systems to ensure smooth interaction between government and citizens and government and businesses. Second, it is the use of electronic technology to optimize the internal workings of the government to "simplify and improve democratic government and business aspects of governance" (Backus, 2001, as cited in Kumar, 2014, p. 6). Building strong relationships with both internal and external stakeholders helps the government to realize its objectives of establishing e-governance systems. While optimizing internal processes to enable the government to deliver higher quality services, it also creates an avenue for enhanced user experience among citizens and the business community.

E-governance encompasses various forms of utilization of ICT and internet-based infrastructure to create a network of several independent entities rolling out services like e-registration, e-participation, e-taxation, e-mobilization, e-education, e-service delivery, e-feedback, e-policing, e-debate, and analysis of public financial statements (Danfulani, 2013). The rationale behind the use of ICT and the internet to provide services, hitherto procured manually, is to ensure the realization of some good governance indicators like transparency, cost efficiency, and an improvement in the general wellbeing of beneficiaries of such services. When deployed effectively and efficiently, e-government systems can lead to the realization of the sustainable use of public resources through virtual collaboration within an integrated network of public and private agencies.

2.3 E-governance and E-government

There is widespread confusion over the exact meaning of the terms e-governance and e-government owing to the multiplicity of definitions in past and current literature. This phenomenon evinces a lack of consensus on the delimitations of each concept. This has led to the two terms being used interchangeably, albeit incorrectly, in various settings mostly outside of academia. The introduction of other related terminologies such as m-governance, m-government, e-democracy, and e-participation has further condensed the fog of misunderstanding surrounding the true meanings of these related but none identical

concepts (Taylor & Lips, 2008). However, there seems to be a convergence of thought on the centrality of information and communication technologies and the internet to the actualization of e-governance and e-government. The potential of using ICT and the internet to improve access to information and to ensure institutional efficiency and effectiveness is also present in the plethora of definitions regarding e-governance and e-government.

E-governance uses digital technologies to enhance various administrative processes in order to achieve efficiency and effectiveness. Heeks (2001) opines that e-governance goes beyond the mere automation of the internal processes and processing of data within a government. E-governance uses a multitude of ICT-enabled routes to transform the government's external workings through communication and data processing. He further posits that the practice of e-governance has transitioned from intranets to internet thus, providing an impetus for 'joined-up thinking,' increased accountability, improved services, support for learning and concerted action, and enabling social and economic development. In the end, the use of ICT in governance tends to unify people, processes, information, and technology to achieve the core objectives of governance. This process can be thought of as 'i-governance' (integrated governance). E-Governance includes the various processes public agencies must adapt to develop and deploy successful e-government services. E-governance, therefore, integrates a broad spectrum of complex ICT networks into a unified system to make the governance process better and less balkanized for government and end-users.

E-government, on the other hand, focuses on an institutional approach and therefore is a subset of e-governance. It primarily seeks to use ICT and internet-enabled operations to bring about the desired transformation through innovations in the workings of public institutions of governance. E-government uses technology to assist individual public institutions in delivering on their mandate. Zakaria (2015) writes that the use of ICT applications in the management of public systems to accomplish tasks like "processing, filing and retrieving of information" is what e-government is (p. 16).

2.4 E-government interactions

Governments are consistently interacting with diverse interest groups across society, and it is not possible to have a single taxonomy that will capture all these groups – citizens, employees, businesses, NGOs, cohesively. Admittedly, there has been no consensus of thought within the academic and research community on the broad levels of e-government interactions. For those who advocate a three-level

classification, Government-to-Employee classification should be subsumed under the Government-to-Government umbrella because employees are part of the government and cannot sufficiently constitute a separate entity in an e-government interaction model. Ndou (2004) makes a case for a four-level classification of the interrelationships that exist within the framework of e-governance platforms. Figure 1 below illustrates the various interactions in government.
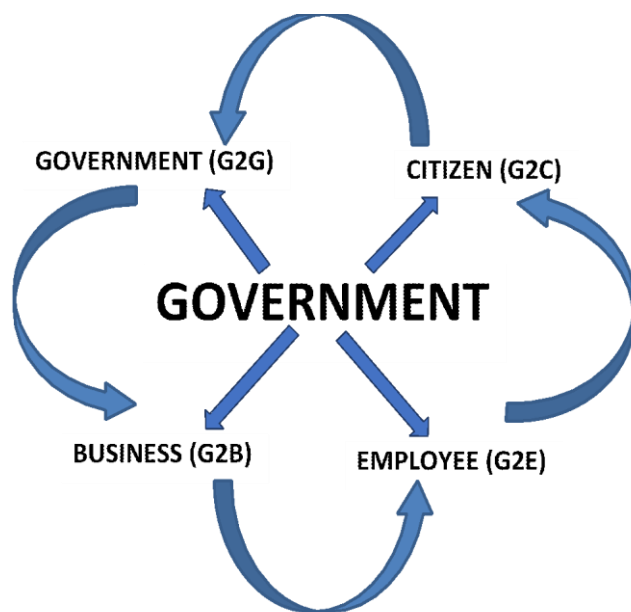
Figure 1: The various interactions in E-government

2.4.1 G2C (Government-to-Citizens)

This deals with the establishment of an electronic interface to enable a two-way communication channel between the government and its representatives and citizens. G2C contributes towards the improvement of public service delivery through a transparent, effective, and efficient system of disseminating information and receiving feedback with minimal let or hindrance. Citizens are empowered through such virtual platforms to access information and complete transactions with public agencies remotely (Bose, 2004). G2G platforms bridge the gap between the supply of public information and services by government and the demand by citizens for same.

2.4.2 G2G (Government-to-Government)

This category of interaction deals with the electronic sharing of data/information systems between various state agencies. It uses the internet and other digital communication tools to create a channel for the free flow of information within a complex web of governmental agencies, departments, and

organizations at a national, state, or local government unit. It facilitates ease of access to shared data by relevant public agencies, thus fostering greater online collaboration within the government (McClure, 2001).

2.4.3 G2B (Government-to-Business)

This concerns the relationship that exists between the government and its agencies on the one hand and the business community on the other. It bridges the gap between the two entities by creating an internet-enabled platform for the exchange of information between government and businesses; thus, businesses can access, download, complete, and submit forms and documents online (McClure, 2001). E-procurement, bid submission, e-payments, e-transfers, and virtual meetings are but a few G2B services currently on offer.

2.4.4 G2E (Government-to-Employees)

Interactions here seek to leverage the power of ICT and the internet to improve employee efficiency and effectiveness by streamlining processes and providing opportunities for employee development through collaboration and knowledge sharing. Employees are given access to pertinent information that will help them perform their duties well. Information like employee compensation, skills development initiatives, labor rules and regulations, policies, and developing trends are made available to bring employees up-to-speed with developments in their field of operation (Carbo & Williams, 2004). G2E provides internal and external support systems needed to empower employees to implement the agenda of government successfully.

2.5 E-governance service delivery approach

Primarily, there are two approaches through which e-government systems deliver the services they are designed for – agency-centric and citizen-centric approach. Studies regarding current approaches to e-governance systems point to a shift from agency-centric service delivery to a user-focused/citizen-centric approach, as systems are primarily designed to facilitate interactions between government and citizens (Karkin & Janssen, 2014; Alshibly, & Chiong, 2015). One of the reasons for the preference of the citizen-centric approach is the ease with which services are delivered across multiple agencies. When systems are designed with the interest of departments at the forefront, according to Al-Khouri (2011), "any services that requires approvals or intervention of more than one department, would take a long time to deliver" (p. 24). This makes it unable to deliver to the satisfaction of citizens who might lose faith in such technological innovations and resort to the traditional means of seeking services with its associated challenges. This will

eventually limit the impact of e-governance on end-users and negatively impact citizens' perception and adaptation of new technologies.

A citizen-centric approach to e-governance design focuses on placing the user at the core and tailoring all aspects, from the conception of the idea to actual usage, to suit the needs of the end-user. For e-governance projects to succeed and serve the needs of users, it is imperative to design the system with the end-users in mind rather than the institution placing itself at the core of the design (Alateyah et al., 2013; Jaeger & Bertot, 2010). One of the ways a citizen-centered approach works is to integrate the individual websites of public agencies with a single point of entry to ensure ease of access by users. Piehler et al. (2016) posit that practitioners should ensure the functionality of e-government portals in terms of "the design, ease of use, reliability and outcome quality" to meet the expectations of the citizen. They further argue that agencies must move beyond merely informing users of online services to making sure that their presence and services appeal to patrons on an "affective and emotional level as well" (p. 184). A user-focused approach to e-governance increases user satisfaction and the possibility of greater engagement with the government electronically, thereby realizing the benefits of e-governance. Singapore's eCitizen portal (www.ecitizen.gov.sg) and South Korea's e-service center (www.egov.go.kr) are examples of citizen-centric designed portals.

2.6 Stages of E-government Development

The stages involved in the development of e-government systems vary depending on the conceptualization of the authors. However, moving beyond terminological inexactitudes, there are subliminal themes that are embedded in the myriad of steps proposed. These commonalities bring to the forefront the core stages imperative to the successful development of e-government systems based on the experiences of other countries. While authors have put up different stages through which the development of e-governance systems go through, one unifying theme is the online presence through websites and information sharing at the initial stages with two-way communication and system integration being the hallmark of the later stages of e-government development. The UN e-government survey has adopted a model that consists of five stages (UN report, 2004).

Stage 1 – Emerging presence: this is the stage where the government decides to adopt the use of technology in its interaction with the public. A limited number of services are rolled out, and it is usually accomplished through the setting-up of standalone websites by various agencies of government to equip

the public with general information. It is usually a one-way channel of communication as avenues for end-users to interact with the responsible agency are typically absent (UN report, 2004).

Stage 2 – Enhanced presence: during this stage, the quest to increase online visibility becomes more pressing, and many other agencies begin to set-up websites while those with websites now frequently put up updated content to keep citizens abreast of developments within the agency and government. However, the flow of information is still unidirectional at this stage – from top to bottom (UN report, 2004).

Stage 3 – Interactive presence: this is the phase where the various agencies begin to transition from just providing updated information about their activities to a much more interactive mode. The public is therefore not seen as only consumers of online content from the responsible government agency but as a constituent whose voices need to be heard. Avenues are created to enable the public to interact with the information and the host agency responsible for the content (UN report, 2004).

Stage 4 – Transactional presence: at this stage, the requisite mechanisms to enable a two-way communication channel are up and running. The public is now encouraged to patronize online platforms and to interact with government via online platforms (UN report, 2004).

Stage 5 – Networked (fully integrated) presence: this is the last stage where the various standalone agency platforms are consolidated. The integration of the numerous public agency websites and portals are now manifested in the level of services and online interactions like G2G, G2C, C2G (and reverse) interactions. Public agencies become proactive in their dealings with the public and pursue purposeful attempts towards e-participation in the governance process (UN report, 2004).

It is easily discernible from the numerous models that though the names and the number of the stages differ, they do turn to have similar constituents, particularly the first and the last stages of the various models. The first stage usually revolves around the establishment of a web presence to provide basic (static) information while the last stage seeks integration of systems to bring about a higher level of transformation in the society (Hiller & Bélanger, 2001; Moon, 2002).

Also inherent in the several models is the inevitability of transitioning from a one-way to a two-way e-governance system that allows for online interaction and transaction among diverse interest groups. This is apparent in the emphasis on online forms, feedback mechanisms, and general deployment of e-services as e-governance systems mature (Hiller & Bélanger, 2001; Moon, 2002).

However, while some of the models presented end with holistic integration/transformation, some authors have ended their models with good governance themes. For instance, whiles Hiller and Bélanger (2001) and Moon (2002) end with political participation, Siau and Long (2005) end their very similar five-stage model with e-democracy.

Regardless of the different terminologies and the varying number of stages, the fixation on integration in most of the maturity models is a testament to the centrality of integration (vertical and horizontal) to the successful implementation of e-governance initiatives. Successful integration of the services rendered to the public is contingent on the level of interoperability of ICT infrastructure at the agency level and on the comprehensive definition of day-to-day scenarios, which can be tackled efficiently through the pooling of public data and infrastructure (Veit & Huntgeburth, 2014). Standalone information and communication systems must be joined-up to maximize the potential of e-governance to deliver the expected results to stakeholders.

2.7 ICT Development in Ghana

Ghana has been at the forefront of ICT development in Sub-Saharan Africa, and significant initiatives continue to be implemented to ensure sustained growth. This is partly attributable to the commitment of successive governments to the continuous maintenance and development of critical ICT infrastructure to support Ghana's ICT growth (Achampong, 2012). Ghana's sustained growth in ICT infrastructure has been impressive since the establishment of the first internet connectivity in 1989 (Ghana e-Health Policy, 2010). In 1994, the government liberalized the telecommunications sector and adopted the Accelerated Development Programme, a five-year plan aimed at restructuring the telecoms sector to enhance national development. Ghana's pioneering role in international telecommunications and IT was partly the result of considerable investments in modern telecommunications and general IT infrastructure with political commitment and the participation of the private sector (PIWA & UNDP, 2011).

The Data Development Group of the World Bank points to Ghana's tremendous strides in ICT infrastructure growth in comparison to other Sub-Saharan African countries. It indicates that while the average growth in ICT infrastructure between 1995 and 2000 stood at 1.1%, Ghana's rate was an impressive 3% (Opoku, 2003).

By August 1995, Ghana became the first in West Africa and the second in sub-Saharan Africa to reach full internet connectivity. This feat was the cumulative result of fruitful cooperation between the

government of Ghana and a host of other organizations. Pipex International played a pivotal role in the registering of 'GH.COM' as the first commercial internet in 1993. It is safe to conclude that the quick pace at which Ghana developed its internet infrastructure in the 1990s was mainly due to the partnership between the government and the private players in the industry. Responsive regulations and clear-cut policies for the sector influenced the flow of private capital into the building of a robust telecommunication industry (Quaynor et al., 1997).

In 2004, the parliament of Ghana approved the Ghana ICT for Accelerated Development (ICT4AD), which captured the vision of the country in an age of information and technological advancement. The ICT4AD is "A policy statement for the realization of the vision to transform Ghana into an information-rich knowledge-based society and economy through the development, deployment, and exploitation of ICT within the economy and society" (Ghana ICT4AD, 2003). Expectedly, the policy received a massive endorsement from major stakeholders because of the extensive consultative process which captured the concerns of key players in the industry. The iterative process, which informed the drafting of the policy, ensured broad-based support and accelerated the implementation phase because of the general goodwill the bill enjoyed (Ghana ICT4AD, 2003).

With time, the concerted efforts by stakeholders towards building a robust ICT infrastructure began to show in the increasing rate of internet usage. Internet penetration increased from 0.2% (about 30,000) in 2000 to 5.3% (1.3 million) by June 2010, placing Ghana among the countries with the highest internet penetration rate in sub-Saharan Africa but well below the African average of 10.9%, which was primarily influenced by high internet penetration rates recorded by the North African Countries, whose rate ranged from 20% to 30% (Achampong, 2012). Whereas Ghana's performance was outstanding within Sub-Saharan Africa, the superior performance from North African countries meant that Ghana's performance was below average on the continental scale.

2.8 E-governance in Ghana

The 1990s saw Ghana putting in place initiatives meant to facilitate its adoption of e-governance to improve public service delivery and consolidate government revenue from trade. These initiatives, to move away from the manual system towards automation, were backed by some of Ghana's bilateral and multilateral partners who assisted with technical and financial resources. The mainstay of these initiatives was centered on the provision of computers and the electronic capture of data to serve a platform for

future integration efforts by the government. Subsequently, under the Structural Adjustment Program (SAP), the records and functions of civil servants were captured onto a single database - the Ghana human resource management automation system (Osei-Kojo, 2017). This initiative was short-lived as it was fraught with teething problems, including technical and financial constraints. Though the system did not deliver on its promise, it pointed the nation towards the necessity of e-governance and also offered useful lessons going forward.

2.9 GCNet

By the late 90s, reviews carried out by the World Bank, the International Monetary Fund (IMF), and others encouraged Ghana to adopt recommendations on policy reforms, which culminated in the launch of the Ghana Gateway Project under a build-own-operate-transfer arrangement. The Gateway project was designed to mirror the TradeNet project of Singapore, which had been highly successful in Singapore and Mauritius. A joint venture company, Ghana Community Network (GCNet), was established and tasked with the responsibility of the management of customs systems and the installation of electronic data interchange (Wulf and Sokol, 2004). GCNet was expected to design a system which will be effective and efficient in helping the government to regulate the external trading environment. The system designed was to comprehensively assist in tracking and recovering revenue due to the government from trade by streamlining international trade in Ghana.

Currently, GCNet operates as a digital network in charge of commerce and customs related transactions at all the sea and inland ports of Ghana. The impact of GCNet is not only limited to the development and implementation of ICT-based solutions and customs management to increase government revenue but also to propel the use of electronic technology in other sectors of public life. Osei-Kojo posits that the implementation of the GCNet system became a foundational stone for the rolling out of other e-government projects in Ghana. He opines that in 1995, GCNet enabled the development of a Computerized School Selection and Placement System (CSSPS) which contributed towards the reduction of, "high administrative costs, human errors, delays, and malpractices, the CSSPS injected efficiency, transparency, simplicity, and speed in school selection and placement from Junior High School to Senior High School" (2017, p. 2). GCNet was instrumental in bringing all the stakeholders working within the international trading space under an umbrella network, which greatly enhanced efficiency.

The new system was to streamline the operations of the various actors, do away with the balkanize structure of the old system, and reduce loads of paperwork involved in trade, customs, and revenue mobilization. It has been pointed out that under the old system, importers needed to go through between 25 and 32 different stages before clearing their consignments. The new system, therefore, provided a platform where participants in international trade could submit a single document online to GCNet, who will then forward it to the responsible agency and relay their response to the trader. The objectives of GCNet are:

● Systematic monitoring and tracking of consignments from port to destination.

● Enable regulatory agencies to access a common database required for regulatory functions.

● Improved trade facilitation and quick clearances.

Per Wulf and Sokol, "the objective of integrating all traders into a community of this kind is to reduce traders' transaction costs and to make the government's regulatory operations more effective and efficient" (2004, p. 24).
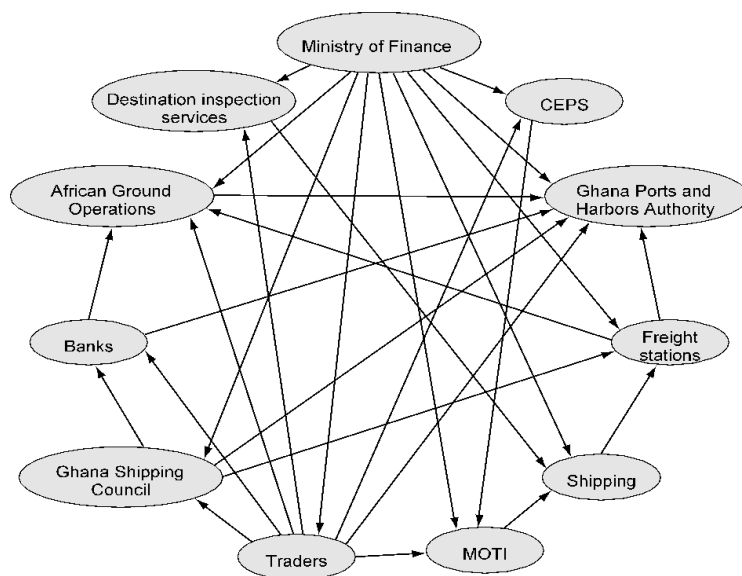
Figure 2: GCNet service model 1

Sources: GCNet

POST-REFORM
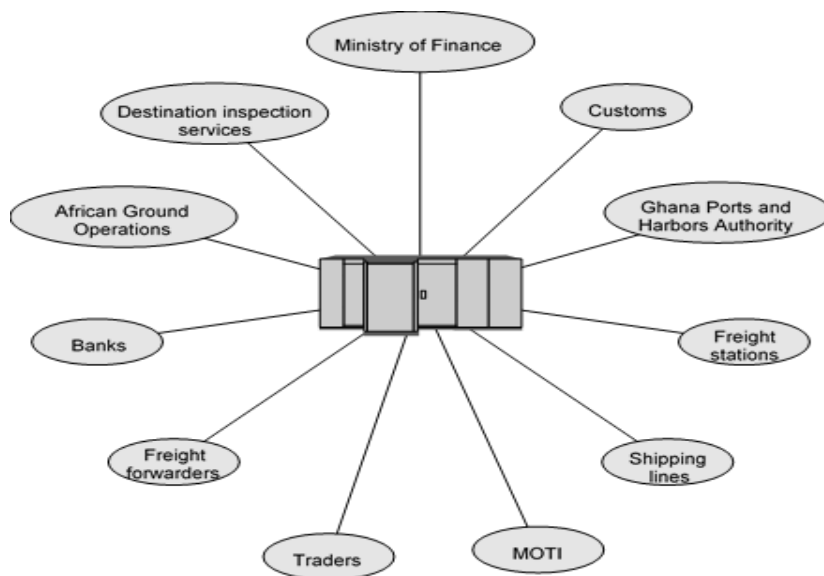
Figure 3: GCNet service model 2

Sources: GCNet

2.10 E-Ghana Project

Following the work that GCNet had done in creating a one-stop-shop for the trade and customs community in Ghana, steps were taken to replicate the concept more broadly and holistically, steps which gave birth to the e-Ghana project. The e-Ghana project was the brainchild of the Ministry of Communication with the financial support of US$ 40 million from the World Bank through a standard International Development Association (IDA) credit facility in August of 2006. The project was meant to serve as a support system for e-government initiatives in Ghana through the employment of ICT in the strategic development agenda of the country under various forms of public-private partnerships (PPP). The project was designed with the following three components:

I)   creating an enabling environment (US$ 9.6m)

II)   attracting investments in IT and promoting the development of indigenous businesses (US$ 9.5m)

III)   Implementation of e-Government services and communication (US$ 22.6m) (Mensah, 2016).

Though some financial and other resources were already secured, the project was restructured in May of 2010 with additional funding of US$ 44.70 million for a new component - Ghana Integrated Financial Management Information System (GIFMIS).

The project has since received financial support from multiple sources like the Chinese EXIM Bank, the Danish government, European Union (EU), and the United Kingdom Department for International Development (DFID). In May of 2014, the project went through a second restructuring to ensure full closure of some project activities and was finally closed on December 30, 2014, with a total disbursement of US$80.25 million from IDA resources (e-Ghana project, 2016).

As part of the implementation framework for the e-Ghana project, the National Information Technology Agency (NITA) was established through an act of parliament NITA Act, Act 771, 2008). As the implementation arm of the Ministry of Communication, its core mandate is to oversee the implementation of ICT policies in Ghana with a mission of creating "an enabling environment for effective deployment and use of ICT by all sectors, through the implementation of sound policies and regulatory framework" (NITA, 2017). Under its mandate of implementing the three components of the e-Ghana project mainly, the third component, NITA, has developed online portals to streamline the operations of some government agencies while reducing administrative bottlenecks associated with some public agencies.

The e-Ghana project provided the impetus for the systematic pursuit of e-governance initiatives. The third component of the e-Ghana project, which speaks to the development of e-governance, led to the implementation of e-services by NITA, the state agency charged with the responsibility of actualizing the vision of the e-Ghana document. NITA in fulfilling its mandate has created an e-Government Network Infrastructure to extend the "national backbone infrastructure to all districts in the country and provide a national data center and a secondary data center facility for disaster recovery capability, and ultimately connect all public institutions and MDAs and MMDAs to a single shared communications and computing infrastructure to facilitate effective delivery of government services to citizens, businesses and others" (NITA, 2017).

The e-Government Network Infrastructure has aided the computerization and integration of the three arms of government at the national, regional, and district levels. So far, all the capital cities and some major townships; Ministries, Departments and Agencies' (MDAs); Metropolitan, Municipal and District Assemblies (MMDAs); major health facilities; security services and educational institutions have been connected to the e-government network (Mensah, 2016). In fulfilling this mandate, the ministry of communication has issued a directive against the use of private email servers for official communication. All agencies are expected to migrate onto the official government email domain, which is '.gov.gh' on or

before the 31st day of December 2019. It is expected that the use of the official government email server will engender trust and help the government track official correspondence in real-time.

2.11 Some e-government services in Ghana

The impact of the e-Ghana project is evident in the deployment of various e-government and e-service initiatives to facilitate interaction between the public and state institutions in the country. Below is a table of selected e-services in Ghana and their portals.

Table 1: Some e-government services in Ghana

NAME	PORTAL	SERVICE
Government of Ghana Portal	ghana.gov.gh	Official website of the government of Ghana
Ghana Presidency	http://www.presidency.gov.gh/	Information about the presidency
Ghana MMDAs	http://www.ghanadistricts.gov.gh/	One-stop-shop information center for metropolitan, municipal and district assemblies in Ghana
E-Payment Services	epay.gov.gh	Government e-payment portal for the public to pay government taxes, fees, goods & services
The Registrar General's Department	http://rgd.gov.gh/	Online registration of businesses, industrial property, marriages, administration of estates, and public trust.
Computerized School Selection and Placement System (CSSPS)	http://cssps.gov.gh/	Automated selection and placement of JHS pupils to SHS

e-payslip	https://www.gogpayslip.com	Online access to payslips for public sector workers
Driver and Vehicle Licensing Authority (DVLA)	http://dvla.gov.gh/	Online platform for vehicle examination & driver licensing
Ghana Open Data Initiative (GODI)	http://data.gov.gh/	The open data portal for the public to access information

Source: Compiled by author

2.12 Ghana's e-governance ranking

The UN in 2001 embarked upon a project to benchmark the state of e-governance among member countries, and this led to the development of the E-government Development Index (EGDI) which ranks countries on a scale ranging from 0.0 (worst) to 1.0 (best) and classifies them into four categories namely; Low EGDI (< 0.25); Middle (0.25 – 0.50); High (0.50 – 0.75) and Very high (> 0.75). Historically, the West African region has lagged in e-government surveys of the UN, mostly performing below the global average. The 2008 UN E-government survey revealed that of a global average e-government readiness score of 0.4514, the West African region could only manage a score of 0.2110. None of the forerunners in e-government in the region, Cape Verde, Nigeria, and Ghana, with scores of 0.4158, 0.3063 and 0.2997 respectively, could attain the global average (UN Ed, 2008). However, the past decade has seen an improvement in the rankings of some West African countries.

The considerable financial investments in ICT infrastructure in Ghana are beginning to pay dividends, as shown by the improvement in Ghana's EGDI ranking moving from a low of 138 in 2008 to 101 in 2018. The 2018 report notes that the transition of Ghana from middle to high on the EGDI ranking has been partially due to the streamlining of "institutional and policy frameworks to capitalize in ICT innovations" (UN survey, 2018, p. 85). Some of these government-led innovations which are contributing towards the realization of the benefits of e-government are the e-Ghana and e-Transform projects; The Ghana Shared Growth and Development Agenda (GSGDA); and National Electronic Security System among other ICT-related interventions. The 2018 ranking also features Ghana in the high category of various e-governance ranking including, Online Service Index (OSI), Human Capital Index (HCI), Telecommunication

Infrastructure Index (TII), and E-participation Index (EPI). Ghana currently ranks 5th in e-governance on the African continent. (See appendix G).

1.13 Sustainable development

The term sustainable development has gained much traction following the publication of the Founex Report on development and environment in 1972 and the Brundtland Commission's report 'Our Common Future' in 1987. Initially, environmental sustainability was the foremost concern of sustainable development as world leaders sought to reduce the concentration of greenhouse gases to acceptable levels during the 1992 UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil (Sathaye et al., 2011). The extensive use of the term in almost every field of human endeavor has made it a primary objective of several local and international agreements. Contrary to popular opinion that sustainable development is a novel idea, Clarkson et al. (1992) opine that sustainability, which imposes on humankind a sense of stewardship, has been practiced for thousands of years by various indigenous societies. Sustainability themes are an ever-present feature of unwritten laws and folklores, which emphasizes the fiduciary relationship between humans and the earth (our Mother) to "ensure the survival of the seventh generation" (p. 12).

Though it has become a fancy term globally, scholars have found it challenging to formulate a definition that encapsulates the various meanings of sustainable development. Sustainability, according to Ashby (2009), "is a word that has come to mean whatever the user wants it to mean" (p. 319). Dobson (1996) identified over 300 different definitions and interpretations, all purporting to explain the concept of sustainable development. The availability of this pool of definitions in literature signifies a keen interest in the field as "each definition is necessarily contested and contestable" (p. 402). This dilemma is, however not peculiar to sustainable development. Indeed, almost all the broad fields within the umbrella of social science lend themselves amenable to narrowing or broadening of their meaning and hence their definitions are constantly in flux. The groundswell of interest, which has been generated in existing fields with regards to sustainable development is evident in the addition of the word 'sustainable' to a lot of goods and services. "Since the introduction of the concept, many international conferences, congresses, summits and meetings have been held, resulting in various declarations, reports, resolutions, conventions and agreements and dealing with the environmental problems" (Tomislav, 2018, p. 73).

The word sustainable per the Webster's Ninth New Collegiate Dictionary (1985, p. 1189) has its roots in the Latin word "*sustinere,*" which implies the ability "to hold up." The Marriam-Webster's Advanced Learner's English Dictionary defines the word 'Sustainable' as 1: "able to be used without being completely used up or destroyed." (2008, p. 1659). This means that inherent in the concept of sustainability is the ability of an entity to endure and perpetuate itself. The Oxford Advanced American Dictionary for learners of English defines "develop" as, 1: "to gradually grow or become bigger, more advanced, stronger" (2011, p. 407). The same dictionary defines 'sustainable' as 1: "involving the use of natural products and energy in a way that does not harm the environment" (p. 1505).

Based on these dictionary definitions of the two terms - sustainable and development- the basic idea behind the term, sustainable development is growth or increase that can be maintained over a period. Of the myriad definitions available in the corpus of literature on sustainable development, the definition of the Brundtland Commission contained in the report titled, Our Common Future has been widely used as a generic definition. It defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WECD, 1987, p. 43). Sustainable development has, at its core, the incorporation of a forward-thinking mindset to all human endeavors to guarantee a better quality of life for present and future generations.

The exigencies require that global and national leaders act in concert to confront the challenges that have and continue to plague humanity. Global and national partnerships towards achieving the goals of sustainable development should be tailored towards the attainment of four fundamental goals: "economic prosperity; social inclusion and cohesion; environmental sustainability; and good governance by major social actors, including governments and business" (Sachs, 2015, p. 4). In order to achieve the all-encompassing sustainable development goals (SDGs), it is imperative to secure the support and commitment of both state and nonstate actors because the challenges are over and beyond the capacity of government alone (Florini and Pauli, 2018). Without multi-stakeholder partnerships in the lifecycle of sustainable development initiatives, it will be nearly impossible to achieve sustainable development. The cooperation and active participation of the broader society who are the intended beneficiaries must be solicited and nurtured.

2.14 The triple bottom line

The Triple Bottom Line (TBL or 3BL) term, as coined by John Elkington in 1994, seeks to capture

the environmental, economic, and social impacts of an organization's activities as opposed to the hitherto fixation on just the financial bottom line. From the perspective of Elkington (2013), "the TBL agenda focuses corporations not just on the economic value that they add, but also on the environmental and social value that they add – or destroy" (p. 3). This was in recognition of the fact that the corporate focus on financial sustainability was creating new patterns of development that were socially and environmentally unsustainable. So often, progress is measured in terms of economic indicators, which has resulted in a fixation on boosting economic performance with little regard for the potential imbalances an overconcentration on one aspect might have on the entire developmental spectrum. The pursuit of a single bottom line (economic) "boosts our economy, yet sacrifices the environment. The social dimension is often either missed or not prioritised" (Cheshmehzangi and Dawodu, 2018, p. 15). The idea of the three-pillar model of sustainable development is to forge a path of development which integrates the economy, ecology, and society into the global development psyche. The TBL concept was in sync with the sustainable development agenda as it sought to ensure a balance in development and to guarantee that social and environmental welfare were not neglected in the pursuit of corporate profit (UN, 2005; Hammer & Pivo, 2017).

Meeting the demands of the triple bottom line has proven to be a daunting task for corporate and national leaders to accomplish holistically. The need to prioritize and pursue progress on multiple fronts, coupled with the onerous task of "trying to appease a working relationship between business, politics, society and the natural environment, is an irritatingly difficult task" (O'Neil, 2018, p. 21). To successfully achieve the triple bottom line, a great deal of cooperation and collaboration are necessary. The iterative process required to deliver the sustainable development goals calls for political will, corporate devotion, and the buy-in of the society at large.

2.14.1 Economic sustainability

Economic sustainability revolves around the responsible use of the factors of production to create goods and services without sacrificing the economic health of the society at large. According to Meyer (2009), "economic sustainability revolves around the availability of the production factor capital, which consists of infrastructure – and also fixed capital such as buildings and machinery... Sustainable economic management guarantees that this capital stock will be passed on to following generations" (p. 60). The economic pillar of sustainable development establishes a cost and benefit relationship between economic

activities and their respective outcomes. The desire of individuals and corporations to make profits should be pursued in a manner that promotes the holistic development of all sectors of society. Economic gains should reflect in the development of the other subsystems of the TBL. Alhaddi (2015) avers that "The economic line ties the growth of the organization to the growth of the economy and how well it contributes to support it. In other words, it focuses on the economic value provided by the organization to the surrounding system in a way that prospers it and promotes for its capability to support future generations" (p. 8). The quest for profit maximization should not be pursued at the detriment of the environment, society, and posterity.

2.14.2 Social sustainability

The social sustainability aspect of the TBL gives attention to the repercussions of individual and corporate actions on the entire community. It promotes the development of human capital and alternative development and business practices, which enhances the wellbeing of society. Corporate practices should, out of necessity, add value to the communities where they operate. As Goel (2010) notes, the social pillar of the TBL deals with issues such as, "employee relations, health and safety, ratio of wages to cost of living, non-discrimination, Indigenous rights, impact of community involvement and customer satisfaction" (pp. 31-32). Without a deliberate effort to promote social equity and wellbeing, sustainable development will fail to yield the benefits that could be realized from the other pillars. The Rio Declaration on Environment and Development recognizes the importance of the social dimension in its first of 27 principles. Principle 1 of the declaration states that "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature" (1992, p. 1). The expected outcomes of sustainable development are to make the planet more habitable for humans, hence the need for the social pillar to ensure that all sustainability measures ultimately inure to the wellbeing of humans.

2.14.3 Environmental sustainability

The environmental dimension of the TBL framework examines the consequences of human activities on the ability of the natural environment to continuously support human existence in the short and long-term. Following from the Rio de Janeiro Earth Summit in 1992, "the concept of sustainable development-involving the integration of environmental thinking into every aspect of social, political, and economic activity-has become central to the environmental debate" (Elkington, 1994, p. 90). The focus here is to shield the environment from the devastation wrought on it in the pursuit of economic and social

advancement. It promotes the responsible exploitation of the earth's resources to allow for environmental regeneration and renewal. Pertinent issues that are addressed include, "the amount of energy consumed and its origin, resource and material usage, emissions, effluents, and waste management, land use and management of habitats" (Goel, 2010, p. 31). Along with the right to exploit the resources of the earth for development comes the duty to preserve the environment for the coming generation. This is necessary to ensure the availability of sufficient quantities of vital resources and help avert conflicts that might arise from unhealthy competition for natural resources, either presently or in the future.

2.15 E-governance for sustainable development (EGOV4SD)

The process of governance has evolved due to the many advances in various sectors of human endeavors. Notably, the remarkable strides made in the technological front have impacted the art of governance around the globe. The breaking down of traditional barriers to governance and the swell of support for good governance ideals have been the concomitant effects of the incorporation of ICT into governance, electronic governance. As a *sine qua non* of sustainable development, e-governance bridges the gap between the promise and the realities of sustainable development. It is, therefore, exigent to explore and establish the nexus between e-governance and sustainable development, particularly in developing countries like Ghana.

The relationship between e-governance and sustainable development is paramount to societies as e-governance does not only make the attainment of sustainable development feasible but also catalyzes the process towards the attainment of sustainable development. EGOV4SD has been defined as the "use of ICT to support public services, public administration, and the interaction between government and the public, while making possible public participation in government decision-making, promoting social equity and socio-economic development, and protecting natural resources for future generations" (Estevez & Janowski, 2013, p. 96). EGOV4SD leverages the power of ICT to serve as an enabler of sustainable development by facilitating multidimensional interactions among stakeholders operating within a dynamic system. It establishes a connection between hitherto separate groups of people and opens a two-way communication channel where it traditionally does not exist.

In Ghana, the implementation of e-government projects is increasing steadily and generally touted by policymakers and politicians as a positive sign of development. The dynamic relationship that exists between e-government systems and the trinity of sustainable development are being explored because of

the growing interest in the field. However, the bulk of literature seems to circle the economic underpinnings with the other two pillars being placed on the backburner. The shortfall is that given the complex environment in which e-government systems operate, losing sight of the bigger picture may lead to the development of unintended challenges, thereby watering down the contribution of e-government systems to sustainable development. This is because economic sustainability may be achieved at the expense of progress on the environmental and social fronts (Smith et al., 2010). Consequently, the appraisal of e-government initiatives should weigh its ability to maintain a healthy balance within a dynamic system.

2.16 Conclusion

This chapter has examined the relevant body of literature necessary for a critical appreciation of the research topic. The scholarly works that have been reviewed will serve as a source from which subsequent chapters will draw. The literature has highlighted the relevant aspects of e-governance and sustainable development as well as some of the policies Ghana has implemented over the years to improve upon its ICT infrastructure and promote e-governance.

The literature review has shown a few limitations found in the vast corpus of literature on the topic. Though there is a large body of literature on e-governance, scholarly works, specific to Ghana, are limited. Little attention, if any, has been devoted to the relationship between e-governance and sustainable development in the country. A preponderance of literature focused on the benefits, challenges, and adoption of e-governance to the neglect of other aspects.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This study seeks to assess the use of information and communication technologies in the process of governance and how it can facilitate the sustainable development agenda of Ghana. The ideal way to conduct such a study will be to collect and analyze the empirical data that is relevant to the investigation. Since the overarching goal of this research is an in-depth understanding of e-governance and its role in Ghana's sustainable development and to generalize in a limited way outside the dataset used, it is incumbent on the researcher to choose a research strategy that facilitates an in-depth understanding of the issue at hand. In order to fulfill the research objectives, a mixed-method research design is used as it allows for the use of qualitative and quantitative methods to complement each other. Johnson and Onwuegbuzie (2004) refer to the mixed-method research design as the "third research paradigm" (p. 15) whiles Mayring (2007) has described it as "a new star in the social science sky" (p. 1).

The use of a mixed-method is justified by the OECD when they say, "quantitative indicators may be needed, but some form of qualitative assessment may be appropriate, depending on how the desired outcomes have been defined" (2006). A mixed-method approach helps to paint a complete picture of the phenomenon under study as it covers more ground than either a purely qualitative or quantitative method can achieve. Since both qualitative and quantitative methods have their strengths and shortfall, synergizing them in a research study may help enrich the quality of findings. It, therefore, behooves the researcher to diligently apply the tools in a manner that produces the right results efficiently (Ubels et al., 2010; Ortiz & Taylor, 2009). Focus group discussions and a survey (questionnaire) will be used as the principal research strategies.

FGD was chosen as the preferred approach for gathering qualitative data because of its suitability to the study objectives. Kreuger (2008) posits that FGDs have a unique advantage of providing a platform where participants are encouraged to share their experiences, whether positive or negative, in an environment that is supportive. Since the study aims at soliciting the opinions and experiences of respondents, it is necessary to use an approach that is known to "encourage participants who feel reticent about expressing their views to talk. Hearing other views can stimulate discussion and allow elaboration and evaluation of contributions" (Harper and Thompson, 2011, p. 64). Expertly moderated group

discussions help to bring new perspectives and meanings to the topic under study, which could be useful in understanding the topic in a holistic manner.

The decision to employ questionnaires as a tool for quantitative data collection was informed by the desire to seek the opinions of a larger body of participants at a reasonable cost. Brancati (2018) notes that the questionnaire also has the advantage of higher return rates as the respondents can quickly answer the questions, particularly with a close-ended questionnaire. These advantages make it a suitable survey instrument for an academic inquiry such as this one.

3.2 Data Collection

A mixed-method research design was used to carry out this study. Primary and secondary sources were explored to answer the research questions and achieve the objectives therein. At the end of two months of data collection (June 7, 2019, to July 31, 2019), six separate focus group discussions and four hundred questionnaires were conducted/administered to individuals in three regions of Ghana; Greater Accra, Ashanti, and Northern. However, three hundred and eleven (311) persons completed the questionnaires they were given. As much as eighty-nine (89) persons failed to either return the questionnaires or ignored the invitation to complete the questionnaire. The focus group discussions were, however, immensely successful since they were well patronized.

First, as a form of qualitative research, six focus group discussions (FGD) were organized to solicit information from diverse groups of people. Focus group discussions are "semi-structured group interviews designed to elicit information from participants on a defined topic of interest" (Brancati, 2018, p. 156). Such discussions are usually meant to give participants the opportunity to provide information to the researcher through the sharing of experience, knowledge, and individual perspectives on an issue of interest in an atmosphere of informality. Focus groups, like semi-structured one-on-one interviews, require the use of an interview guide to direct the conversation, but researchers are not obliged to strictly follow the guide as the guide principally serves as a directional instrument (Stringer, 2014).

The focus groups composed of participants with diverse interests and backgrounds – citizens, business persons, and government employees – were part of every group discussion. The purpose of the focus group discussions was to gain insights into the experience and level of satisfaction of participants in accessing information, downloading and completing forms, submitting documents, and completing transactions online on government portals. Another reason for the adoption of this method is the desire of

the researcher to gain "direct insight into the preferences, opinions, emotions, attitudes and so forth…" of participants regarding Ghana's e-governance and its influence on sustainability (Brancati, 2018, p. 156).

An interview guide is a document containing a list of questions that sets out the tone of the research discussion and marks out the parameters of the interview (Horn, 2009). A guide, therefore, becomes a compass that the researcher relies on to stay on track during the interview/discussion stage of the study. The guide used for this study was designed to be used across the country for all the six FGDs. During the design phase, the researcher considered the diverse nature of the participants and consequently employed a language that is clear, precise, and culturally appropriate. To reflect the objectives of the study, the questions were worded to encourage open discussion and avoid yes/no answers.

The researcher recorded all voice data from the FGDs using a SONY ICD-PX470 Digital Voice Recorder and captured non-verbal cues in a field notebook to ask follow-up questions. After every session of FGD, the tape was played *ad infinitum* for the researcher to listen to and to transcribe the voice data onto an MS Word document. Both the recorder and the laptop containing the transcribed data were passworded and kept under lock and key to ensure the confidentiality of data and to guarantee the anonymity of participants.

A survey instrument (closed-ended questionnaire) was used to gather quantitative data from the public who patronize various e-government services and therefore had firsthand experience of the services. A survey instrument was used because of the desire to compare and generalize the results of the study in a limited context. Surveys usually involve "collecting information from a sample of individuals in order to construct quantitative descriptors of attributes of the larger population from which the sample is drawn" (Brancati, 2018, p. 263). For this study, three hundred and eleven respondents were surveyed to know their thoughts on the research subject based on a set of twelve close-ended and two open-ended questions. Deliberate attempts were made to ensure a balanced representation in terms of gender, age, education, and occupational status. A closed-ended questionnaire was used to gather data because of its appropriateness to the study objectives. For the respondents, it is quick and easy to answer, and the recall burden is less as compared to an open-ended questionnaire. For the researcher, it offers an inexpensive means to collect data from a larger group of respondents, a higher response rate, relatively easy to administer, code, and analyze (Johnson et al., 2016).

Furthermore, secondary data were collected to augment the findings from the primary data; FGDs and surveys. Secondary data was gathered from policy documents, documented interview transcripts, field notes, textbooks, journal papers, country reports, dailies, and selected web pages.

The design of a survey instrument has an impact on the quantity and quality of responses that can be generated from the administration of the instrument. Generally, a questionnaire design considers the visual layout of the questionnaire and the ease with which it can be answered by the target respondents. Since the questionnaire was a self-administered one, it was designed to be visually appealing, with the questions couched using simple language devoid of jargon. E-government and sustainable development terminologies are explained on a separate sheet under the heading 'Glossary of Terms' and attached to the questionnaire.

After the development of the initial questions for the study, the research supervisor and readers were given the document to review and critique. The process yielded constructive feedback on the questions. Subsequently, some of the questions were reworded, split into two, or deleted. Some questions were also added based on the suggestions of the reviewers. After the revisions were effected, the questionnaire was self-administered by five randomly selected students of AUC whiles ten Ghanaian students responded online via Whatsapp. Based on feedback from the respondents of the pre-test, the questionnaire was finalized.

The questionnaires were distributed to respondents after an initial interaction with the researcher. Questionnaires were handed out to persons only after the researcher had confirmed from them that they had basic knowledge of e-governance and/or sustainable development. Questionnaires were distributed in academic institutions, offices, shopping malls, libraries, cafes, open markets, and various public spaces. Respondents included 11 civil servants, 8 SME owners, 10 NGO/CBO employees, 19 students, and 5 unemployed persons.

3.3 Sampling

The use of a sampling method in conducting research has become necessary, given the fact that not all potential participants can be included in the research process. A suitable sampling technique is, therefore, necessary to ensure that the researcher can interact with the relevant subgroups to get information that will be reflective of the entire population (Saunders et al., 2012). The sampling technique adopted in selecting participants for this study is the non-probability purposive sampling method. Given the

nature of this research, it is imperative to use a method that ensures that participants have a basic appreciation of e-governance, sustainable development, and the necessary experience to answer the questions insightfully. The use of non-probability purposive sampling technique allowed the researcher to handpick the most suitable participants from the population to take part in the research (Babbie, 2006).

3.4 Data analysis

The approach to use in the analysis of qualitative data depends on the suitability and, to an extent, the researcher's preference. However, two types of qualitative data analysis approaches have become quite popular. Researchers either employ the content approach or thematic approach in their quest to make meaning out of qualitative data (Braun & Clarke, 2006). These approaches are both used in the development of a framework to describe and organize data into meaningful sets (Patton, 2002). For analyzing the qualitative data from this study, the thematic approach (TA) is used. The thematic approach is used to group data into chunks based on their degree of similarity. A theme, according to Joffe (2012), refers to specific patterns of meaning embedded in the data. These can either be easily discernible (manifest content) or quite difficult to recognize (latent content). Themes, therefore, refer to "patterns of explicit and implicit content" (p. 209).

Researchers are often provided with two choices to use in arriving at the themes of their research. The themes can be drawn from a theoretical idea (deductive) before the actual research is conducted or from the raw data collected by the researcher (inductive). This study applies the inductive method to demarcate the relevant themes from the data gathered by the researcher. For this research, four steps were applied following those of Boyatzis (1998, p. 11).

i.   Sensing themes – that is, recognizing the codable moment
ii. Doing it reliably – that is, recognizing the codable moment and coding it consistently
iii. Developing codes
iv. Interpreting the information and themes in the context of a theory or conceptual framework – that is, contributing to the development of knowledge.

The researcher conducted an edit of data gathered from the FGDs by examining transcripts of all the responses given to all the questions posed by the researcher throughout the FGDs. This editing process was intended to identify and minimize as much as practicable, typographical errors, incompleteness, and gaps in the data obtained from respondents.

For purposes of analysis, the researcher developed codes and subsequently identified the main themes that emerged from the transcriptions of the FGDs. For the most part, the researcher summarized responses given by participants and occasionally quoted verbatim responses given by participants as contained in the transcripts.

The researcher presented and analyzed the findings that emanated from the responses to the questionnaires using SPSS (Statistical Package for the Social Sciences). The same software was used to convert data into graphs, charts, and tables to make comprehension easier. Percentages were also used to make it easier to compare responses to the various questions. The application of qualitative and quantitative techniques to data collection and analysis, which has been termed as triangulation by Horn (2009), makes it possible for researchers to detect unique characteristics in data sets and objectively infer from the responses (Horn, 2009).

3.5 Ethical Considerations

Since the research study was designed to collect information from human subjects, which involved face-to-face interaction, sharing of experience and personal opinions, the researcher secured the necessary approval from the Institutional Review Board (IRB) of AUC before moving to the field to collect data through focus group discussions and surveys. Ethical considerations were applied in the process of data collection and data handling to guarantee the confidentiality and anonymity of participants in the study. Participants were adequately briefed on the academic nature of the study, what the study involved, and how their response and data will be used. Interested participants were given consent forms to read through and append their signatures. They were also made aware of their right to withdraw from the study at any point and to inform the researcher if there is any data, the use of which as part of the study, they are not comfortable with.

3.6 Conceptual Framework

The conceptual framework in Figure 4 below depicts the nexus between e-governance and sustainable development, as expressed in its varied aspects (pillars of sustainable development), namely economic sustainability, social sustainability, and environmental sustainability. E-governance constitutes the independent variable, while economic sustainability, social sustainability, and environmental sustainability are dependent variables. The understanding is that e-governance relates to and has an impact on the sustainable development of any country.

Information and communication technology have been used to facilitate the delivery of services in almost every sphere of life. Presently, its application is gaining prominence in national governance to perform tasks that were hitherto accomplished manually. Its ubiquitous nature has given rise to terminologies like m-government, e-democracy, computerized accounting, cloud computing, virtual classrooms, et cetera. The prudent application of ICT can help in developing human capital, which could be utilized for both economic and social advancements and lead to global competitiveness (WEF, 2015). The role of ICT as a general-purpose technology is to enhance efficiency in the domains they are applied to. It is not an end, but an enabler of the processes involved in the accomplishment of specific objectives

Governance refers to the art of managing the affairs of a group of people to achieve shared objectives. It usually leverages the resources available in the community and manages it judiciously to optimize the benefits and prolong the lifespan of community resources. "The purpose of governance is to guide, steer, and regulate citizens' activities through the power of different systems and relations to maximize the public interest" (Keping, 2018, p. 3). Governance entails decision making on how to provide goods and services efficiently. It is against this backdrop that the application of ICT becomes imperative in the quest of the government to deliver on its mandate in the most efficient manner.

E-governance, therefore, entails the combination of ICT and governance to facilitate the attainment of specific desired goals. The UN defines E-government as "the use of information and communication technologies and its application by the government for the provision of information and public services to the people" (UN E-Government Survey, 2014). E-governance ensures that government services are not only available to residents of urban and peri-urban areas, but also those from the rural areas and marginalized communities. Access to quality information is a powerful tool that could be used to help citizens make better decisions regarding their economic and social wellbeing and give them a voice in the governance process.

Applied efficiently, e-governance could be used to reduce costs, promote social justice, and enhance environmental sustainability. Estevez and Janowski defines e-government for sustainable development as using "ICT to support public services, public administration, and the interaction between government and the public, while making possible public participation in government decision-making, promoting social equity and socio-economic development, and protecting natural resources for future generations" (2013, p. 96). Initiatives such as e-filing and e-procurement in public administration results in

less administrative expenses, lighter workload, faster processing, less commuting, and fewer costs to the public in their daily interaction with government. These accompanying benefits are what Ghana aspires to, which is evident in the recent reforms aimed at leveraging technology to enhance development.

Leveraging e-government systems to support sustainable development will require the integration of e-government systems to increase the economic, social, and environmental benefits, among others. Such integration will require the development of a policy document to guide the present and future development of e-governance. A policy, per the Webster's Ninth New Collegiate Dictionary, is 2: "a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions" (1985, p. 656). Therefore, e-governance for a sustainable development policy will set the ground rules on how present and future e-government initiatives should be designed, implemented and evaluated to maximize its contribution to sustainable development. E-governance for a sustainable development policy will synergize the several benefits of e-governance and facilitate the attainment of sustainable development goals.

Sustainable development aims at situating development in a broader by context considering its intended and unintended outcomes, and how to make development economically prudent, socially sensitive, and environmentally sustainable. Estevez et al. (2013) establish that, in every situation, sustainable development is a problem domain, while ICT remains a solution domain with government being either a problem or a solution domain (problem domain to ICT and a solution domain to sustainable development). Therefore, a combination of ICT and governance (E-governance) becomes a solution to the problem of sustainable development because, whenever it is applied to any sector, it has the potential to facilitate the delivery of sustainable economic, social, and environmental goals. The figure (4) below is an illustration of how e-governance leads to sustainable development.
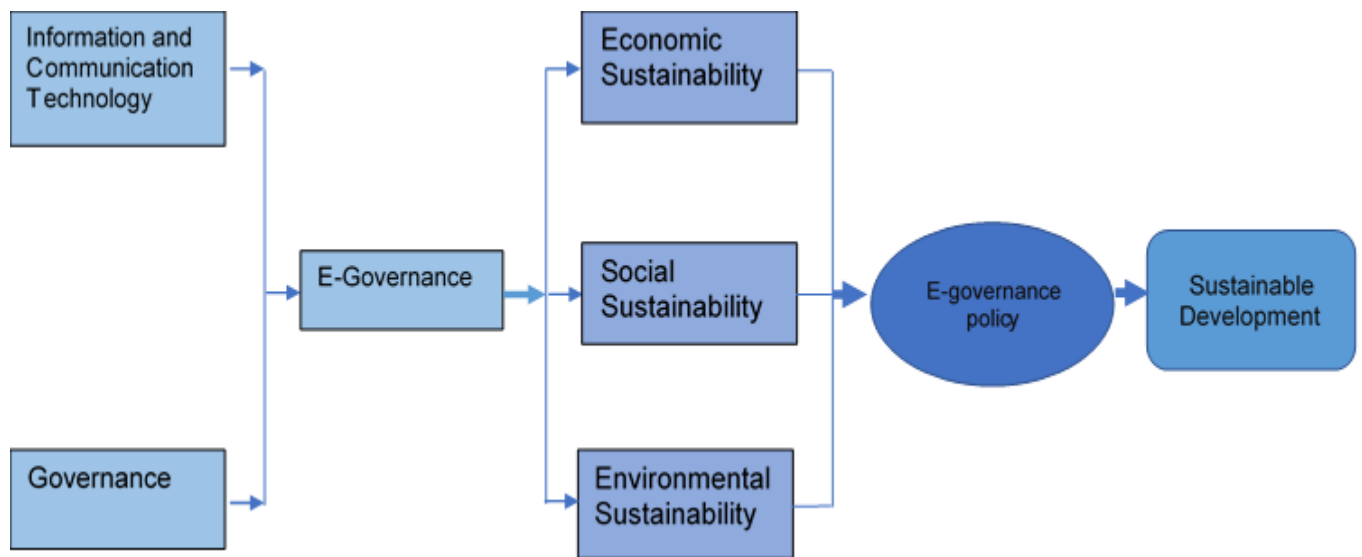
Figure 4:Conceptual framework (developed by the researcher).

CHAPTER FOUR: PRESENTATION OF DATA

4.1 Introduction

This chapter presents the primary data obtained from the field. The FGD guide and the survey instrument (questionnaire) were designed to primarily focus on answering the research questions and fulfilling the study objectives, which are assessing the relationship between e-governance and sustainable development, exploring how to leverage e-governance to enhance sustainable development, and reducing barriers to e-governance adoption. This chapter is divided into two parts; the first section contains quantitative results presented using basic statistics like frequencies and percentages. The second section encompasses the qualitative responses which are presented in the form of narrative text.

4.2 Findings from the Survey

Demographic Characteristics of Respondents

This part of the chapter presents the demographic characteristics of participants in this study, mainly persons who completed the questionnaires that were administered to them. These are primarily informed by the responses of participants, as indicated on the questionnaires received after their completion. As part of the demographic data, the gender and age groups of respondents were collected to find out if these demographic features would have an impact on the use of e-government and whether the results would be consistent with the results from previous studies.

4.2.1 Gender

As noted earlier in the study, participants involved in this study number three hundred and eleven (n=311). Of the 311 respondents, 209 (67.2%) are males, whereas 102 (32.8%) are females. This is illustrated in Figure 5 below.
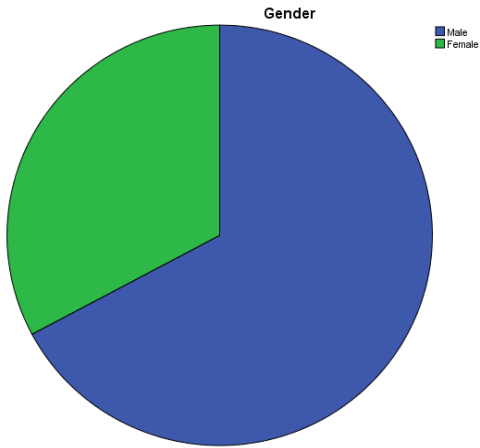
Figure 5: Gender distribution of Respondents

4.2.2 Age group

Respondents were classified into five main age groups, namely 18-25, 26-35, 36-45, 46-55, and, 56-65. Per the data obtained from respondents, 52 (16.7%) persons are aged between 18 and 25, while 139 (44.7%) participants are aged between 26 and 35. Eighty-four (27.0%) respondents admitted to falling within the age range 36 to 45, while thirty-six (11.6%) respondents fell within the age range, 46 to 55. No respondent was over the age of 55. The pie chart below captures the responses.
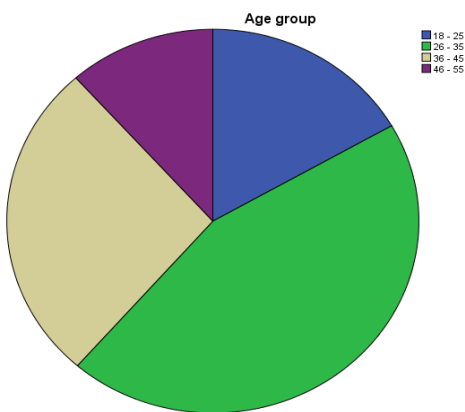
Figure 6: Age distribution of Respondents

4.3.1 Meaning of E-governance

E-governance has been defined and explained in varied ways by scholars. This trend was very much the same with responses received from participants. Below is a compilation of responses from respondents regarding their understanding of e-governance:

- *"The use of ICT in delivering services to the public."*

- *"Government and its agencies made easily accessible through the use of ICT portals or facilities."*

- *"The process of integrating ICT into all aspects with the aim of enhancing the government's ability to meet the challenges of the public."*

- *"Use of technology in governance functions."*

- *"It means using the internet for public service."*

- *"The application of information and communication technology in the provision of government services with the opportunity for citizens and government to communicate."*

- *"A governance system where the use of technology is practiced. For example, a computerized system of voting in elections, information dissemination, buying, and selling, et cetera."*

- *"It means governance through the use of information communication technology."*

- *"It is a system of governance where processes, including the implementation of e-governance, are digitally or electronically based.*

- *"Running services electronically."*

- *"Using a digital governance system to improve conditions."*

- *"It means using electronics in making payments."*

- *"Government listening to the views and suggestions of the people with the help of the internet."*

- *"Making use of electronic systems or technology in the country, mostly in areas of finance and trade."*

- *"Transactions online."*

- *"Applying IT in rendering government services."*

- *"The use of IT in every activity of a country."*

- *"Digital marketing."*

- *"Electronic means of governing people."*

- *"Delivering and having access to information through online services by both the government and the public."*

- *"Convenience in my day to day dealings with public sector institutions/companies in-terms of payment of bills and registrations."*

- *"Governance at the click of a button."*

- *"Computerized communications in government."*

- *"A system of governance that leverages IT in receiving and processing information for social, economic, and political development."*

- *"The situation where almost all governance activities are carried out paperless."*

- *"A process in which the information and communication technology is applied to deliver various government services to its citizens."*

- *"Computerized communications in governance."*

From the responses regarding the meaning of e-governance, most of the respondents had a fair idea of what e-governance entails. The responses generally fell into three categories; technology, governance, and economic transactions. There was a strong presence of technology in almost all the answers, which indicates an association of technology with e-governance, which further suggests that the topic respondents are abreast of the topic.

4.3.2 Preferred Transaction Type

Participants were requested to indicate which of these two they preferred: Online transactions and face-to-face transactions. A whopping majority of two hundred and fifty (80.4%) respondents noted that they preferred online transactions while the remaining sixty-one (19.6%) respondents opted for face-to-face transactions. This indicates that a majority of respondents are comfortable with the use of their electronic devices to interact with public institutions as opposed to the traditional means of accessing service in person. The high level of mobile phone penetration in Ghana might be a contributory factor to the attractiveness of online engagement among participants. Figure 7 below illustrates these preferences.
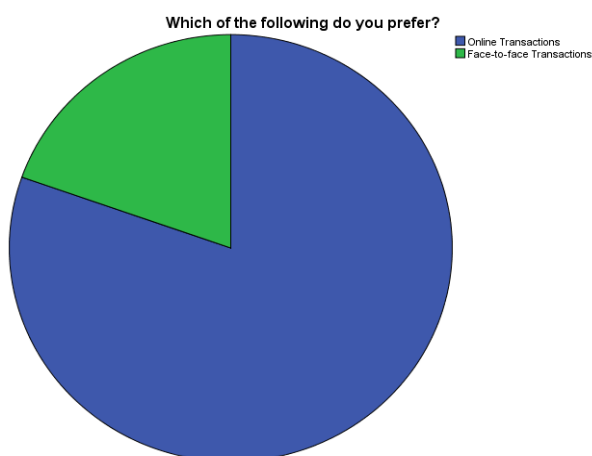
Figure 7: Transaction Type Preference of Respondents

4.3.3. Applications used within the past seven days

Responses from participants indicate that over the course of the past 7 days, ninety-eight respondents had visited WhatsApp (an overwhelming majority), three persons had visited Skype, Facebook (80 respondents), Twitter (17 participants), Instagram (28 sample members), Viber (3 respondents), Imo (9 sample members), Email app (66 participants), Telegram (5 persons) and ten respondents had visited LinkedIn. The results indicate high use of social media among the study participants which also points the fact that they are quite active online. Figure 8 below shows the most used online applications by participants.
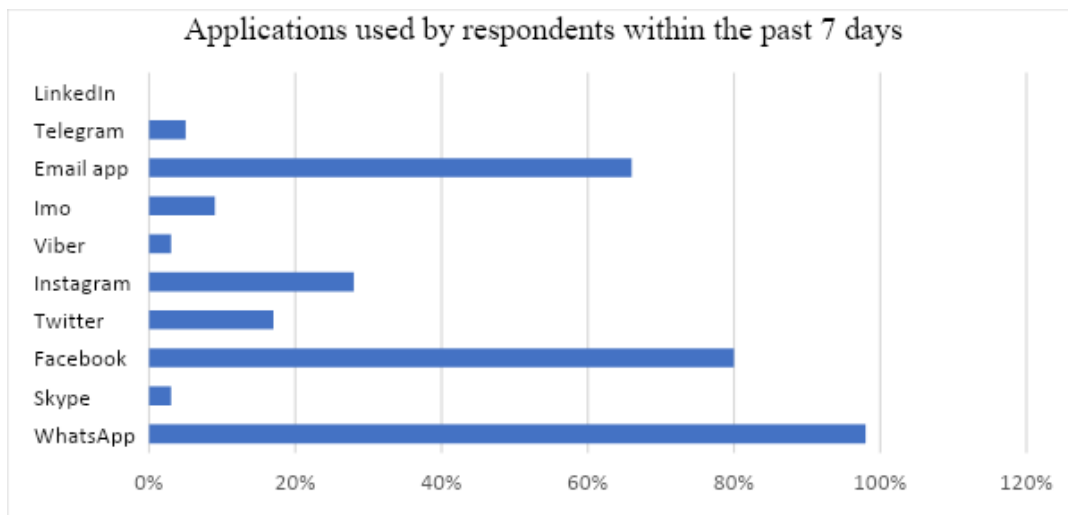
Figure 8: Applications used by respondents within the past seven days

4.3.4 E-government Services Personally Used by Respondents

Figure 11 below depicts the e-governance services personally used by participants in the study. It shows that most participants use Ghana Post GPS. The least used e-governance services surprisingly include ATM Cards, NHIS, and online sales. Though respondents were familiar with many e-government applications, there was no single application that recorded overwhelming patronage among participants. This is perhaps attributable to the heterogeneous nature of the respondents which means they have different needs and interests. The figure below shows that no single e-government platform enjoys the

patronage of 45% respondents.
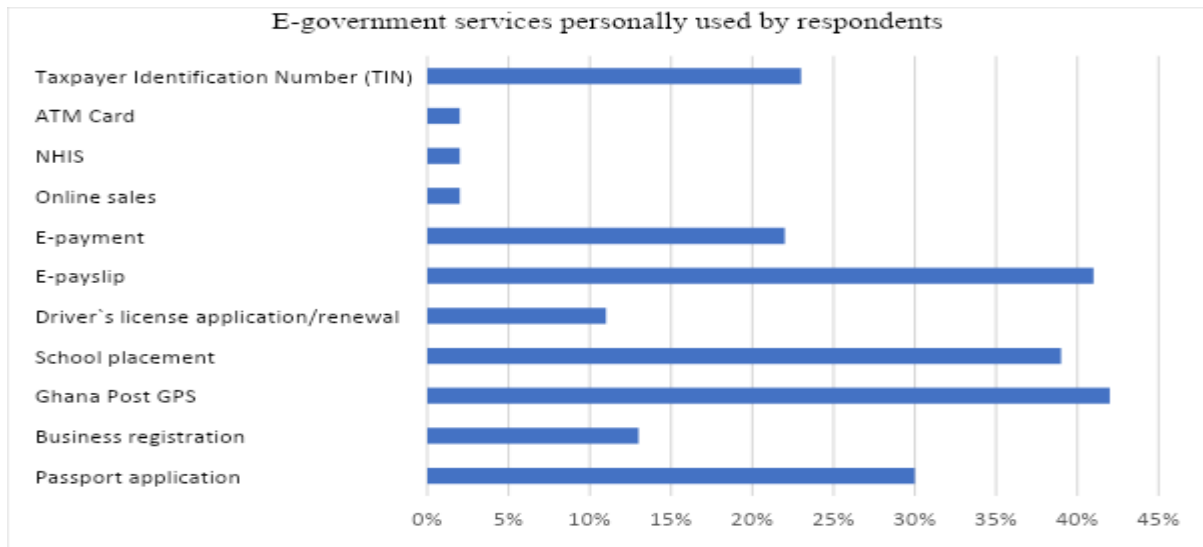
Figure 9: E-government services personally used by respondents

4.3.5 How far is E-governance beneficial to citizens

Respondents were required to indicate the extent to which they agree or disagree with the view that e-governance is beneficial to them on a Likert scale ranging from 'Strongly disagree' to 'Strongly agree.' An overwhelming majority of respondents answered in the affirmative. Of the two hundred and eighty-seven who agreed with the statement, a hundred and seventy-six (56.6%) strongly agreed whiles one hundred and eleven (35.7%) indicated that they agreed with the statement that e-governance is beneficial to them. Interestingly, twenty (6.4%) respondents chose to remain neutral, while two (0.6%) respondents disagreed. Two (0.6%) respondents did not answer the question. With about ninety-three percent of respondents indicating that e-governance is beneficial to them, it is safe to conclude that a majority of respondents have had a positive experience with e-governance and therefore see it as a positive development. This is depicted in Table 2 below.

Table 2: E-governance is beneficial

E-governance is beneficial to you		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	.6	.6	.6
	Neutral	20	6.4	6.5	7.1
	Agree	111	35.7	35.9	43.0
	Strongly Agree	176	56.6	57.0	100.0
	Total	309	99.4	100.0	
Missing System			2	.6	

			Total	311	100.0		

4.3.6 E-governance contributes to Ghana's sustainable development

Participants were required to indicate on a Likert scale the extent to which they agreed or disagreed with the assertion that e-governance contributes to Ghana's sustainable development. Two (0.6%) respondents opted for option 2(Disagree) while twenty-six (8.4%) persons chose neutral. A hundred and one (32.5%) participants admitted they agree, by opting for option four while the remaining participants (58.5%) indicated that they strongly agree (opted for 5) with the assertion that e-governance contributes to Ghana's sustainable development. The relationship between e-governance and sustainable development is central to the research, and the results indicate that respondents feel that e-government can be used as a tool to facilitate the attainment of sustainable development. About ninety percent of respondents were positive that e-governance contributes to sustainability. This is illustrated in table 3 below.

E-governance contributes to sustainable development

Table 3: E-governance contributes to Ghana's sustainable development

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	.6	.6	.6
	Neutral	26	8.4	8.4	9.0
	Agree	101	32.5	32.5	41.5
	Strongly Agree	182	58.5	58.5	100.0
	Total	311	100.0	100.0	

4.3.7 Ways E-governance Contributes to Ghana's Sustainable Development

Below is a compilation of the many responses that were given by participants regarding what they considered to be ways e-governance contributes to Ghana's sustainable development.

- Efficiency
- It reduces the cost of service delivery
- It makes the government accessible to all and accelerates the rate of responsiveness to the needs of the people.
- Social services, like the provision of health insurance, are made available to the public with efficiency and convenience.
- It helps in enhancing public administration, especially in developing countries like Ghana, where public organizations face resource constraints in their delivery of public services.

- Reduces corruption

- Ensures easy access to interacting with government

- It makes services available and accessible to many people and at a shorter duration.

- It helps in research for development and gives solutions to problems bothering people via the internet.

- It prevents theft and promotes the sustainable development of the country.

- The introduction of electronic monitoring devices in many sectors of the economy will help reduce corruption prevalence in the country because face to face contact with public servants is reduced. This has, however, helped some service in some public sector become easily accessible.

- Easy and fast; fast transactions; fast information delivery; easy access to information for the quick response.

- It avoids bureaucracy; it is convenient and secure; it reduces bribery and corruption; it facilitates processes involved in the implementation of policies; it avoids simple errors and or mistakes, et cetera.

- It will make transactions simple.

- Make use of the taxation services to generate income since transactions are automatically taxed.

- Citizens get easy access to government information.

4.3.8 Challenges faced by participants in using e-government services

Participants indicated the challenges they encounter in their quest to access e-government services, which also serves as a barrier to the widespread adoption of e-government services in Ghana. Per the data collated, Poor connectivity, (66% of respondents) and high cost of data (60% of participants) and non-response from government officials (45% of respondents) constitute the significant challenges most respondents encounter in the use of e-government services. Thirty-four percent and thirty percent of the respondents admitted to challenges either because of information security concerns or unfamiliarity of software, respectively. Twenty percent of respondents indicated they face the challenge of the absence of local languages, while another twenty percent pointed to challenges regarding poor website design. Figure 12 below illustrates these challenges as selected by respondents.
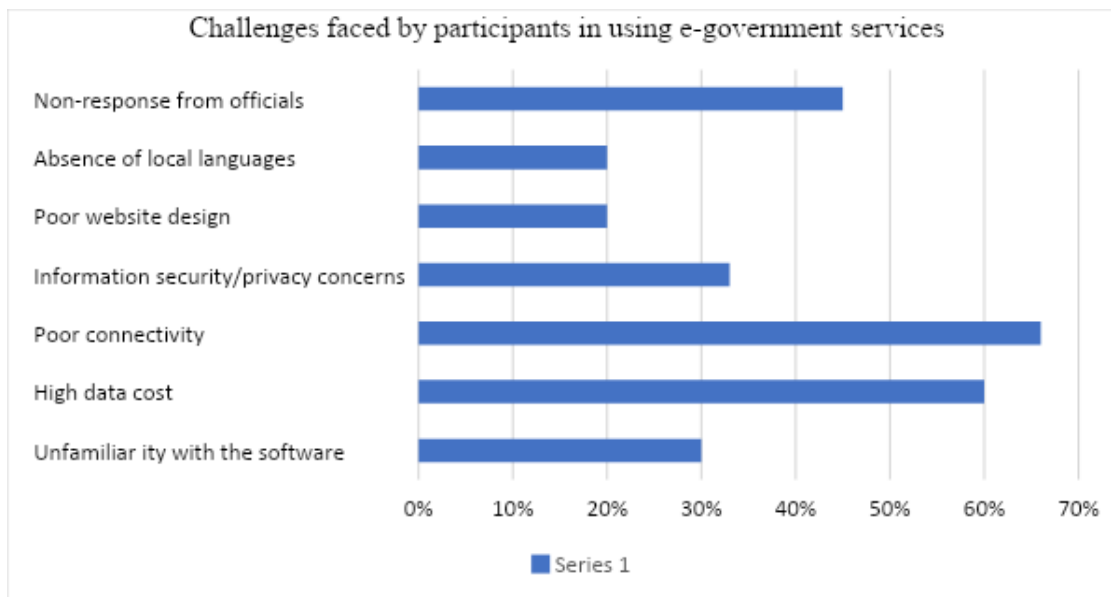
Figure 10: Challenges faced by participants in using e-government services

4.3.9 How e-government services can be improved in the future

Respondents gave a variety of suggestions as to how e-governance services can be improved in Ghana. These they indicated by selecting from the available options, notably digital literacy, privacy & security, localizing content, affordable broadband services, affordable data packages, public hotspots, capacity building (employees), stable connectivity, multiple languages, and user-friendly websites design. Digital literacy was the most suggested (74%), while over fifty percent of respondents also added stable connectivity, affordable data packages, affordable broadband services, and user-friendly websites design as some of the solutions to the previously identified challenges of e-governance. The responses are captured in figure 13 below.
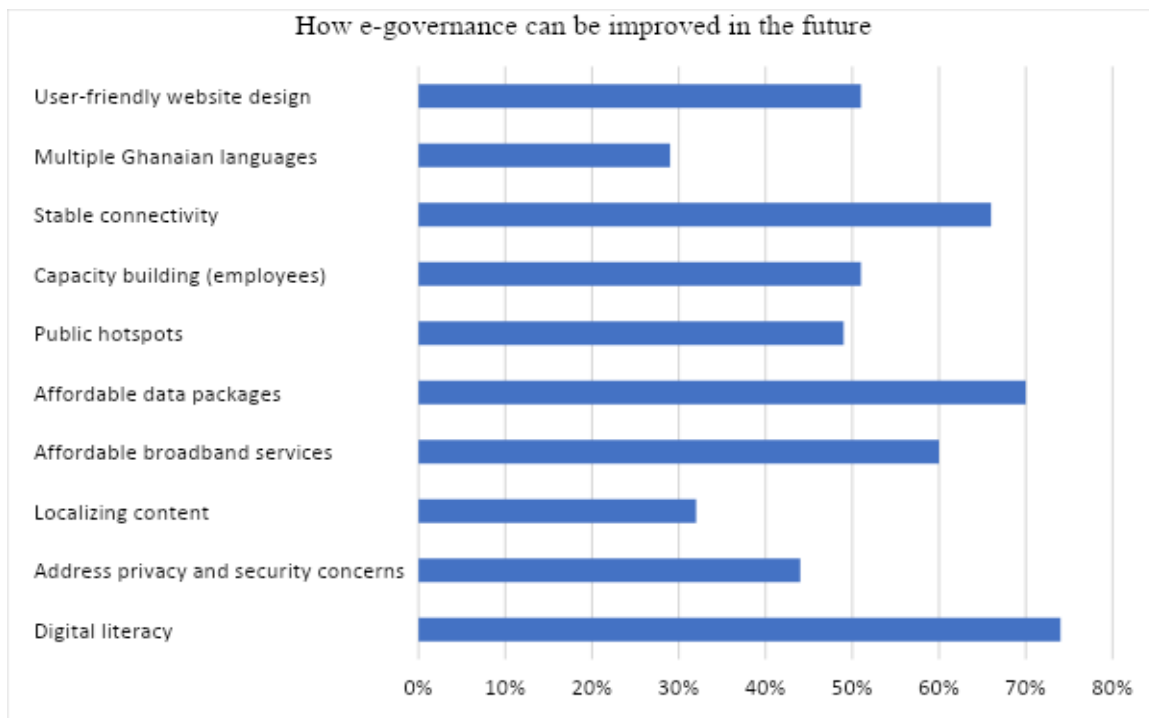
Figure 11: How to improve E-government services

4.4.1 The extent to which participants agree that e-governance is an effective way to promote economic sustainability

On a Likert scale of 1 to 5, respondents were required to indicate the extent to which they agree with the view that e-governance is an effective way to promote economic sustainability. One (1) indicates strongly disagree, while five (5) indicates strongly agree. A hundred and twenty-six (40.5%) of respondents indicated that they strongly agree while one hundred and twenty-five (40.2%) respondents opted for 4 (suggesting they agree). Of the remaining four respondents, (1.3%) opted for option 1, and three respondents chose (1.0%) option 2, the former indicating strong disagreement and the latter indicating disagreement. Fifty-three of respondents representing seventeen percent opted for option 3 (neutral). This pattern was replicated in virtually all subsequent related questions. The results point to the fact that respondents agree with the fact that e-governance could be used to promote economic sustainability. This result fits in with the answers respondents gave initially to the question of the meaning of e-governance. The relationship between e-governance and economic sustainability was present in the answers, and it is again seen in the overwhelming agreement with the assertion that e-government is an effective way to promote economic sustainability. Table 4 below illustrates the pattern of the extent of agreement with specific reference to e-governance being an effective way to promote economic sustainability.

Table 4: E-governance is an effective way to promote economic sustainability

To what extent do you agree that e-governance is an effective way to promote economic sustainability?				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.0	4	1.3	1.3	1.3
	2.0	3	1.0	1.0	2.3
	3.0	53	17.0	17.0	19.3
	4.0	125	40.2	40.2	59.5
	5.0	126	40.5	40.5	100.0
	Total	311	100.0	100.0	

4.4.2 E-governance is an effective way to promote social sustainability

On a Likert scale of 1 to 5, respondents were required to indicate the extent to which they agree with the view that e-governance is an effective way to promote social sustainability. One (1) indicates strongly disagree, while five (5) indicates strongly agree. One hundred and twenty-two (39.2%) of participants strongly agreed with the statement, while a hundred and six (34.1%) of respondents picked option 4 (agree). Twenty point nine percent (20.9%) of respondents remained neutral, with the remaining eighteen participants (5.8%) indicating their disagreement by choosing option 2 (disagree). The overall results indicate that social sustainability can be enhanced using e-government. E-governance can be used to increase inclusion, resilience, and create opportunities for upward social mobility. This is illustrated in table 5 below.

Table 5: E-governance is an effective way to promote social sustainability

To what extent do you agree that e-governance is an effective way to promote social sustainability?				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.0	18	5.8	5.8	5.8
	3.0	65	20.9	20.9	26.7
	4.0	106	34.1	34.1	60.8
	5.0	122	39.2	39.2	100.0
	Total	311	100.0	100.0	

4.4.3 E-governance is an effective way to promote environmental sustainability

Respondents were required to pick from options 1 to 5 to indicate the extent to which they agree with the view that e-governance is an effective way to promote environmental sustainability. Option one (1)

on the Likert scale indicates strongly disagree, while five (5) on the same scale indicates strongly agree. Four (1.3%) strongly disagreed with the assertion, while eleven (3.5%) respondents disagreed. Thirty point five percent (95 respondents) chose neutral as their answer whiles a hundred and twelve persons (36.0%) agreed with the statement. Those who strongly agreed were eighty-four (27.0%), while five (1.6%) persons chose not to answer the question. Environmental sustainability is a primary challenge in this era of increasing population and exploitation of natural resources to support human development. It is, therefore, refreshing to note that participants responded in the affirmative to the question that e-government is an effective way to promote environmental sustainability. This is illustrated in table 6 below.

Table 6: E-governance is an effective way to promote environmental sustainability

To what extent do you agree that e-governance is an effective way to promote environmental sustainability?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.0	4	1.3	1.3	1.3
	2.0	11	3.5	3.6	4.9
	3.0	95	30.5	31.0	35.9
	4.0	112	36.0	36.6	72.5
	5.0	84	27.0	27.5	100.0
	Total	306	98.4	100.0	
Missing System		5	1.6		
Total		311	100.0		

4.4.4 E-governance is an effective way to promote good governance

On the question of the extent to which respondents agree with the notion that e-governance is an effective way to promote good governance, a five-point Likert scale was provided in the survey instrument. The data indicate that 110 (35.4%) of respondents strongly agree, while four (1.3%) respondents strongly disagreed. Thirteen (4.2%) of respondents disagreed, with a majority of respondents numbering one hundred and twenty-six (40.5%) agreeing with the statement. Fifty-seven (18.3%) respondents chose option 3 (neutral) whereas one participant (0.3%) did not provide an answer. At the core of e-governance is governance and it is, therefore, not surprising to record that about seventy-five percent of respondents believe that e-governance can promote good governance. A large body of scholarly work has already been devoted to the nexus between e-governance and sustainable development, and the response of participants to this inquiry further affirms findings from earlier studies on the subject. The response to the statement is illustrated in table 7 below.

Table 7: E-governance is an effective way to promote good governance

To what extent do you agree that e-governance is an effective way to promote good governance?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.0	4	1.3	1.3	1.3
	2.0	13	4.2	4.2	5.5
	3.0	57	18.3	18.4	23.9
	4.0	126	40.5	40.6	64.5
	5.0	110	35.4	35.5	100.0
	Total	310	99.7	100.0	
Missing System		1	.3		
Total		311	100.0		

4.4.5 Overall assessment of e-governance services in Ghana base on participants' experience.

On a scale of 1 to 10, respondents gave their overall assessment of e-governance in Ghana per their experience. One indicates very poor while ten indicates excellent on the scale. The results were varied but clustered around the midpoint. Close to sixty percent of respondents rated e-governance services in Ghana at either 6 or 7 which indicates that participants feel that the services are at least above average. This is supported by the UN E-government survey, 2018 which also attests to Ghana's steady progress in e-governance (see appendix 10). The assessment of participants is illustrated in Figure 12 below.
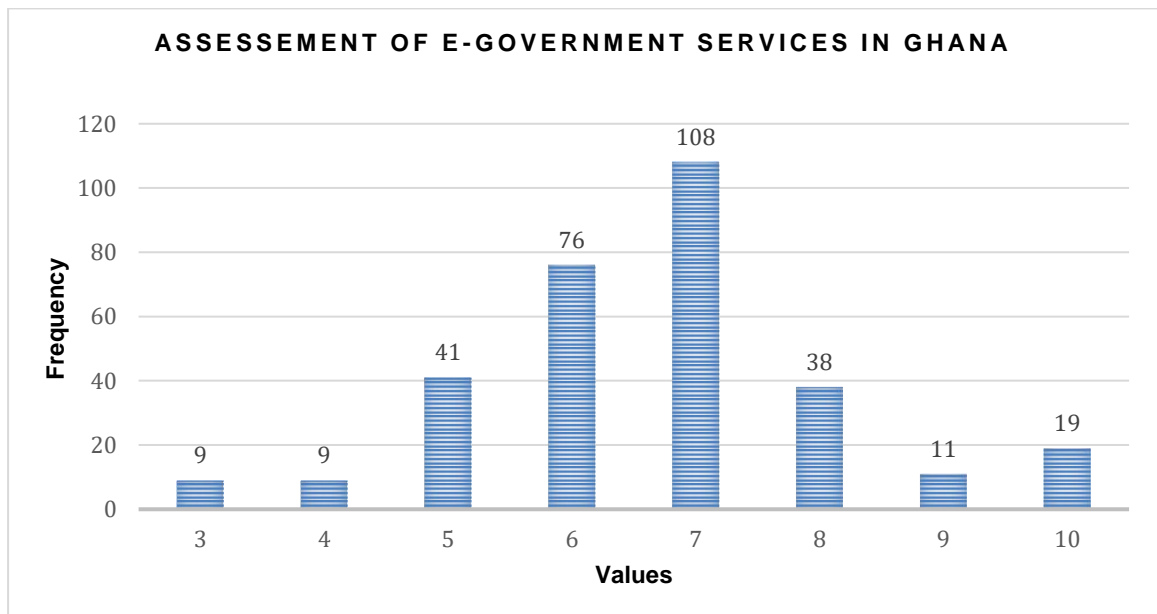
Figure 12: Overall assessment of e-governance services in Ghana based on respondents' experience.

4.5 Findings from Focus Group Discussions

As earlier indicated, the researcher organized and facilitated six FGDs. A nonprobability purposive sampling technique was used to handpick participants for the discussion. This was to ensure that discussants were abreast of the topic and could contribute meaningfully towards finding answers to the research questions. However, apart from their basic understanding of e-governance and sustainable development, the composition of the focus groups was largely heterogeneous as participants were drawn from different geographic, academic, and social backgrounds. Discussions were recorded and subsequently transcribed. Below is a collation of some findings from the FGDs per the myriad of responses given by participants to questions posed. These findings are presented under specific themes.

4.5.1 Meaning of e-governance (MG)

From the six (6) FGDs conducted, it was widely agreed that e-governance involves the use of technology to administer the affairs of a country. It was perceived that any application of technology in the running of the affairs of government or enabled platform for the transaction of business is e-governance. The participants were more inclined to look at e-governance from an economic and governance perspective. Some of the meanings attached to e-governance include the following:

- *Provision of services through online platforms to speed up the conduct of government business.*
- *Implementing government programs online in order to reduce the cost of government delivering services through costly means like the use of human labor, which attracts salary.*
- *The use of ICT in the day-to-day running of government business to reduce cost and preserve scarce resources for other government programs.*
- *Making payments electronically*
- *Payment of taxes and fines online to avoid revenue shortage to the state*
- *Using ICT in our daily activities*

The meanings associated with e-governance from the perspectives of the discussants reflect a general trend of associating technology with governance, which is right. Although some of the responses were examples of the practical application of e-government services, they nonetheless reflect an understanding of what it entails.

4.5.2 E-Government Services Available (ESA)

Generally, participants in the FGDs were conversant with a wide array of e-government applications and innovations that have been rolled out by the government of Ghana. They mentioned a substantial number of such initiatives currently in operation and those that are yet to become fully operational. Though some participants admitted not using most of the mentioned g-government services, they knew what they were for and the purpose for their creation. The significant initiatives mentioned include the following:

> *E-justice (paperless court): A $97 million project launched by the president to use technology to enhance efficiency in the delivery of justice in Ghana. It is expected to result in expedited trials through reduced human errors, increased accuracy, reduced processing time, quick recovery of dockets, automated filling, and the elimination of duplicate suit numbers, among other challenges currently plaguing the judicial system.*

> *Paperless Port System: A paperless clearing system that has increased efficiency at the ports through automation and reduction in bureaucracy. For importers, it increases turnover, and for the government, it reduces revenue leakage.*

> *Electronic Salary Payment Voucher (E-SPV): An online electronic form that captures the punctuality of teachers before they are paid. It verifies and reconciles employee salary information against the data on the nominal payroll.*

> *GCNet.*

> *Computerized School Selection and Placement System (CSSPS): An online platform used by the Ghana Education Service (GES) to allocate Senior High Schools (SHS) to Junior High School (JHS) pupils after their examinations. It enables parents and pupils to select their choice schools and courses in order of preference and access placement information online.*

> *GoGPayslip (Government of Ghana Payslip). An electronic platform designed by the Controller and Accountant General's Department (CAGD) to assist public sector employees access their payslips online. It gives employees around the clock access to their salary history and payslips via mobile phones and other electronic devices.*

4.5.3 E-governance Services Used (ESU)

Participants were asked to list some of the e-government applications/services they have interacted with in the past. Almost all participants had used one of the services listed below in either interacting with a public official or for a business or personal reason. A variety of e-governance services were mentioned by participants, notably online passport application, GhanaPost GPS, mobile money transfer, renewal of health insurance, payment of utilities, online sales (E-commerce), Business registration, ticket reservation (State Transport Company) and e-pay slip (electronic payslip). All participants had used a minimum of two e-government services, and some had the applications on their phones for convenience.

4.5.4 Transactions Type Preference (TTP)

The discussants were upbeat about the benefits that come from the use of e-government both to the individual and the agency. Though the advantages of online transactions were mentioned by participants, a significant number of participants in some groups opted for face-to-face transactions, particularly in dealing with traditional government institutions; relatively few respondents showed a preference for online transactions when it comes to dealing with public sector institutions. Varied reasons were given for the preference. Below are some of the reasons attributed to the preference for face-to-face over online-transactions.

- The high cost of the internet makes it a disincentive to prolong usage.

  "The high cost of the internet makes face-to-face transactions better as one can interact with officials in person, seek clarification, and get the job done before leaving the agency premises. Physical presence also creates a sense of urgency, which propels the service providers into action." Said a young man

- Poor supervision in public institutions which makes it difficult for superiors to check employees when they fail to respond to online queries.
- Internet connectivity challenges, which usually result in having to restart the process all over again.
- Suspected risks associated with online transactions, particularly when money is involved.

4.5.5 Benefits of e-governance in Ghana (BEG)

When asked about what participants consider as the benefits of governance, participants aired various views. These views are itemized below.

- *Increased accuracy in government projections to bring about effective utilization of scarce resources*
- *Enhances revenue mobilization through the electronic capturing of payments made to government*
- *Effective allocation of resources resulting from the use of a comprehensive database to map the needs of communities and groups of people.*
- *Increases transparency and accountability*
- *Reduced workload for public officials because of automation of the everyday process*
- *Uniformity in service delivery*
- *Contributes towards bridging the digital gap because people will be encouraged to up their ICT skills in order to function effectively in a digital ecosystem.*
- *Increased competitiveness on a global scale due to the lower cost of doing business*
- *Reduced pressure on social amenities in urban centers by reducing the need to travel to cities for government services*
- *Easy access to official information via portable electronic devices which are available across the country*
- *Reduction in the demand and consumption of fossil fuel, which leads to a decrease in pollution and depletion of the ozone layer due to less movement of people.*
- *Less costly to consumers because transportation fare is avoided.*
- *Greater convenience for suppliers and consumers of services who do not have to meet in person to exchange goods and services.*

The answers to the question of the benefits of e-governance can be categorized based on several factors. They can be looked at from the point of benefits to those delivering services and recipients of those services. Another way of assessing the responses will be in terms of the pillars of sustainable development. Regardless of the point of view, the benefits of e-governance cut across all facets of modern life. The responses show that e-governance contributes to good governance, economic,

social and environmental sustainability. The ubiquitous nature of the benefits makes a strong case for continuous investment in e-government projects.

4.5.6 Shortcomings of e-governance in Ghana (SEG)

Participants at the FGDs identified quite a few of the issues they consider to be shortcomings and flaws in e-governance in Ghana. Below is a compilation of such views expressed.

- Inadequate ICT infrastructure across the country. This makes it difficult for people in rural areas to adopt e-government and reap the benefits thereof.
- Resistance to technological changes (skepticism)
- High financial outlay at the initial stages for software and hardware procurement
- Privacy and confidentiality (identity theft)
- Unstable internet connectivity
- Low internet penetration
- The high cost of data/broadband services
- Unstable power supply

The shortcomings identified are consistent with the findings of various studies on the continent and in other developing countries. It is, however, interesting to note that some of the challenges can be seen to be local. Issues of erratic power supply might stem from Ghana's experience in the recent past with unstable power supply (*dumsor*).

4.5.7 Suggestions for Improvement (SI)

Following the identification of deficiencies with the current state of e-governance in Ghana, participants variedly offered suggestions as to how e-governance can be improved in Ghana. The following is a compilation of their views.

- *Digital literacy program to target the youth and basic school students to give them a head start.*
- *Gradually eliminating the option of cash payments and face-to-face meetings except for urgent cases.*
- *Affordable broadband services to encourage the acquisition of internet in homes and schools*
- *Affordable data packages to make*
- *Public hotspots*

- *Building capacity of employees (Free ICT training for workers who are not technologically savvy)*
- *Investing in the development of modern ICT infrastructure to guarantee stable connectivity and enhance the user experience.*
- *The use of multiple Ghanaian languages to robe in those who are not able to read and write in English but are literate in one or more local languages.*

4.5.8 Advancing Sustainable Development through e-governance (ASDE)

From the FGDs, there was a consensus that the success of Ghana's sustainable development agenda would be propelled by the adoption of e-governance by both public and private entities in all spheres of public life. Several participants were resolute in their belief that e-governance is a crucial enabler of sustainability in all aspects of public life; hence, it fast-tracks the march towards sustainability. Discussants proposed the following as the ways through which e-governance can advance Ghana's sustainability agenda. Their responses are grouped into themes; economic, social, and environmental.

- **Economic sustainability**: E-governance could be a conveyor belt towards sustainability, particularly in public administration. The deployment of e-government systems is usually associated with substantial financial costs in the form of software and hardware procurement, staff training, and other incidental costs. However, like most capital expenditures, e-government systems tend to have a reasonable payback period, which makes investing in them economically prudent. A shorter payback period translates into the conservation of economic resources as ICT infrastructure can be shared, and less will be spent on recurrent expenditures. Scarce resources will, therefore, be channeled towards the development of other sectors of the economy.

- Also, e-governance enhances transparency through the supervision of workers by their superiors, who can intervene in good time when challenges arise at the workplace. Frontline staff knowing that their superiors are monitoring and that their actions are being reviewed will be encouraged to work as it is expected of them. This will ensure that the public will not be exploited in their quest to access public services, and the money due to the government will be secured as electronic payments and receipts can easily be reconciled with the figures reported by public servants. The government and the public will be better off financially if e-government systems are implemented in public institutions.

- Productivity is one of the ways e-governance could lead to the realization of sustainable development in Ghana. E-governance can measure the productivity of workers and generate performance reports which can be used to evaluate the contribution of workers to the organization. Such a system will incentivize workers to go the extra mile in their quest to serve the public and justify their employment status. Employees will, therefore, devote more time to improving their ratings and cut down on excuses to absent themselves or leave work early. A sound e-government system will also ensure punctuality as workers will be required to clock in on arrival and clock out after work.

- For the consumers of government services, their productivity will experience a boost as they will have more time to work instead of chasing public officials or moving from one office/department to another while their work suffers particularly, sole proprietors. E-governance has the potential to increase the productivity of both public and private institutions, which can boost the economic fortunes of the country as everybody's contribution to the economy goes up.

- The comprehensive deployment of e-governance in Ghana will require the recruitment of people with a unique skill set to manage the massive volume of data and maintain system security. The demand for these skill sets will open employment avenues in non-traditional fields like application/software development, data mining, artificial intelligence, machine learning, system analyst, among others. These demands will translate into jobs for the populace, which will contribute towards the economic empowerment of employees and their dependents. A reduction in the level of unemployment will positively impact all sectors of national life.

- The confidence of the public in financial transactions is one of the synergistic effects of merging ICT with governance. Economic sustainability can thrive if the government places mechanisms to make financial transactions less risky to individuals and corporate bodies in the country. When electronic payments are integrated into e-government systems, the public is more confident in online engagements as they know that payments and electronic receipts constitute evidence that can serve as proof of business dealings and money retrieved where necessary. This will give them

the impetus to support the transformation of the country to a cashless economy, which will boost savings and investments while reducing financial crimes.

- **Social sustainability**: enhancing social sustainability by using e-governance to help make delivery and access to public services convenient and reduce the level of stress associated with seeking public service is possible. E-governance creates platforms that enable the public to access and transact business from the comfort of their homes and offices, which relieves them of the burden of commuting to and from and of the stress associated with being stuck in traffic. The convenience of online transactions reduces stress and thus improves the general wellbeing of the public. It also reduces other insidious types of pollution, which are usually not considered topical in Ghana like visual and noise pollution.

- Increased leisure time with family and friends is yet another way of improving social sustainability in Ghana. When e-government systems are proficiently designed, they reduce the workload on civil servants and allow the customers to accomplish more in less time and, therefore, frees up time for people to bond with family and friends and to engage in their chosen hobbies. Social cohesion will, as a result, be enhanced, leading to a partnership for development. Otherwise, busy people will be able to engage in various developmental activities like communal labor, volunteering, and other social schemes, that will enhance the quality of lives of their communities.

- Additionally, e-governance requires a certain level of digital literacy if it is to fulfill the potential of enabling sustainability in development. Pursuing a path of e-governance will, therefore, lead to an increase in the level of ICT literacy as government, corporate bodies, and individuals will have to upgrade their ICT skills to function effectively in the digital ecosystem. As many people become technologically savvy, the e-governance agenda will become real, and the benefits thereof fully realized. A technologically savvy population will be active participants in the governance process, which will inure to the advancement of the county's sustainability agenda.

- Public safety can also be improved through the deployment of a dedicated e-government system towards public security. E-governance results in the gathering of data on the activities of people,

which can be reviewed when the need arises. If the public is made aware of the electronic trails they leave behind in their daily transactions, it will deter them from engaging in vices, which can undermine the security of the state. The use of public surveillance could also give assurance to the populace that they are safe, and hence they will be encouraged to go about their business knowing that in the event of a crime they will receive assistance in good time. This added sense of security will help develop a culture of trust in society.

- E-governance could also help in preserving peace during elections in Ghana, where allegations of underage and multiple voting are rife. A biometric electoral registration and voting system has the potential to secure the electoral process and to ensure that the electorates will have full confidence in the outcome of their democratic rights. The integrity of the electoral process will promote peace and further cement the moderate gains the country has made in developing itself.

- **Environmental sustainability**: E-governance can be used as a tool to reduce the concentration of GHGs through the conservation of forest resources. Digitization leads to a reduction in the demand for paper during the day-to-day running of government business. The need for paper, which is produced from trees, contributes to deforestation and hence global warming. If e-government systems are implemented, such as the paperless port system in Ghana, it will lead to less demand for paper, and, since a reduction in demand will push down supply, fewer trees will be felled to produce paper. This will help restore the vegetative cover of the country and reduce the concentration of GHGs. Paper waste will also be reduced, leading to a cleaner nation.

- Environmental sustainability can further be enhanced using sophisticated technology to monitor protected areas earmarked for conservation. State authorities will be able to access real-time reports on activities like illegal logging, illegal fishing, and illegal small-scale mining (*galamsey*) which desecrate the land and pollute water bodies.

4.5.9 Challenges in the implementation (CI)

Participants were required to identify the issues they consider challenges in the country's quest to implement e-governance to the latter. While some participants were clueless, a couple of respondents advanced the following challenges:

- Lack of interagency coordination in the development of e-government infrastructure (systems thinking)
- Disparities in the financial strength of allied agencies
- An inadequate human resource base to develop a robust e-governance system for the country.
- The newness/novelty of the field, which still needs people to learn and rise to positions of influence, has contributed to the limited appreciation of sustainability as people in authority might not have a deep appreciation of sustainability.
- Lack of political will due to backlash from those who will lose out if automation is introduced.

4.6.1 Lessons from success stories (LSS)

Relatively fewer participants responded to an inquiry about lessons that can be learned from the success stories of e-governance elsewhere, even though they were encouraged to do so. Most participants did not know the specific measures put in place by other countries beyond knowing them to be good examples of e-governance. A couple of respondents shared their opinions about what they regarded to be lessons from the e-governance success stories from other countries. Below is a compilation of views shared.

- *"We need to build a robust technological infrastructure that would support the State`s e-governance implementation efforts. Our current technological infrastructure isn't nearly enough for full-scale e-governance implementation."*
- *"We need to deploy the nation's technical and technological manpower in our quest to build the necessary systems that will support and help facilitate e-governance in Ghana."*
- *"Adequate funding should be provided for the technical and technological training and development of the requisite manpower to help drive and sustain this agenda."*

- *"A special ministry should be established to oversee the sensitization of the public on the pertinence of e-government in today's world. Such a ministry should support persons involved in apps development and other technologically-related ventures to build their capacity and to increase their technological outcomes."*

- *"We need as a nation to prioritize e-governance by allocating a substantial amount of money to the appropriate ministry in charge of it."*

- *The quest to advance e-governance in Ghana should be aimed at helping solve the peculiar cultural, social, economic, and geographical challenges of our country. Everything related to it should be contextualized to our needs.*

- *The citizens should be educated about e-governance and be encouraged to take advantage of currently available e-governance services. This is the only way we can let them tap into the benefits of e-governance and become part of it.*

5.1 CHAPTER FIVE: DISCUSSION OF FINDINGS

The specific objectives for this study were three-fold, as noted earlier in chapter one of this study, to examine the nexus between e-governance and sustainable development, to explore how e-governance can promote sustainable development in Ghana and to identify ways of increasing the adoption of e-government services. The findings of this study, as presented in the previous two sections of this chapter, brings to the fore pertinent issues that primarily address these objectives. This section discusses some of these relevant findings in the light of available scholarly literature, as explored in chapter two (literature review) of this study.

5.2 The Nexus between E-governance and Sustainable Development

As established in the literature review section, there is ample proof of a nexus between e-governance and sustainable development (Estevez and Janowski, 2013; School et al., 2011; Smith et al., 2010). Different arguments have been presented by scholars that substantially affirm the correlation between e-governance and the pillars of sustainable development (economic, social, and environmental sustainability) and how the former could facilitate the attainment of the latter. The success stories of South Korea and several other nations, particularly in the Western world, point to a link between these two concepts. The sustained development of South Korea has been at least in part attributed to the deployment and functionality of e-governance in that country.

Responses from respondents are mainly in sync with views scholars share regarding the value, place, and nexus between e-governance and sustainable development. From the data analyzed, it is clear that the relationship between e-governance and sustainable development is intrinsic and that the deployment of e-governance will out of necessity contribute to sustainability in one way or the other. Respondents to the surveys conducted overwhelmingly agreed with the statement that e-governance contributes to sustainable development. Ninety-one percent (283 respondents) indicated a certain degree of acceptance that e-governance has a positive relationship with sustainable. Results from the FDGs also complement the findings from the survey. It was the contention of many a respondent that the use of e-governance has a directly proportional relationship with sustainable development and that the two concepts mutually reinforce each other. One participant was of the view that

"E-governance reduces the hurdles to popular participation in governance, which goes a long way to solidify the role of the populace in the decision-making process. Active participation in governance ensures stability in the country, which is a prerequisite for any form of sustainability".

An open government will make policies mindful of the ultimate interest of the populace, which will lead to various interest groups championing their individual/sectoral demands to the government. Once the government aggregates these demands, it becomes easier to rally support towards an all-inclusive development program.

Some respondents have, for instance, argued that an investment in the training, recruitment, and deployment of the requisite workforce to develop the technological infrastructure needed for the advancement of e-governance would afford skilled personnel, who hitherto would have either been unemployed or underemployed, the opportunity to earn a decent income. It could also create a pathway for such persons to contribute to national development through the creation of tailor-made online applications that would supposedly spearhead the developmental agenda that e-governance is expected to facilitate. As noted by one of the participants in the FGDs,

"*The current state of joblessness among the youth is alarming, and something should be done about it. The government can reverse it by retraining unemployed graduates in technology-related fields. This will empower them economically, boost their self-confidence, and help them to play a major role in the development process.*"

The opportunities that come with e-governance are enormous, and each of them has an unswerving link to the sustainability agenda of Ghana. E-governance is an ever-present theme in the web of sustainable development as it accelerates the pace of development in a sustainable fashion. E-governance, therefore, helps in speeding up the march towards sustainable development whiles development in the twenty-first century ineluctably rides on the back of ICT in order to be sustainable.

5.3 Promoting sustainable development in Ghana through e-governance

Available records and literature reveal that Ghana has made some strides in adopting and deploying e-governance services; a couple of e-governance projects such as the e-Ghana project have been rolled out, mostly with funding from donor agencies. The UN`s latest rankings of the deployment of e-governance in countries show that Ghana is one of the countries that has improved in this regard. However, documentary evidence also shows that Ghana's deployment of e-governance services has primarily been

relatively slow and tedious (UN survey, 2018). The State or better still, some State agencies have adopted an e-governance approach to delivering some public services that once required the physical presence of citizens who needed to access such services. The literature reviewed as well as responses from some respondents, identifies some of these services, notably online passport application, GhanaPost GPS, Online Sales (E-commerce), online business registration, e-pay slip, Computerized School Selection and Placement System (CSSPS) amongst others.

The argument is that increased provision of e-government services and access to same could lead to the realization of far more significant outcomes, sustainable development being a critical part of these outcomes. Results from the survey point to a consensus that e-governance is an effective way to promote economic, social, and environmental sustainability as well as good governance.

Table 8: A summary of the responses to question 13

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Economic sustainability	4 (1.3%)	3 (1.0%)	53 (17.0%)	125 (40.2%)	126 (40.5%)
Social sustainability	0 (0%)	18 (5.8%)	65 (20.9%)	106 (34.1%)	122 (39.2%)
Environmental sustainability	4 (1.3%)	11 (3.5%)	95 (30.5%)	112 (36.0%)	84 (27.0%)
Good governance	4 (1.3%)	13 (4.2%)	57 (18.3%)	126 (40.5%)	110 (35.4%)

The summary of the responses (table 8) to question 13 in the survey indicates that respondents identify with the claim that e-governance is an effective way to promote sustainable development. Regardless of the pillar of sustainability in question or good governance, over 60% of respondents either 'Agree' or 'Strongly Agree' that e-governance promotes sustainable development.

Some scholars cited in earlier chapters, as well as some participants in this study, have chronicled how e-governance could be used to promote sustainable development in Ghana, for instance in making access to certain public services faster and less cumbersome, eliminating at least in part the human

element that hitherto allowed bribery and corruption to fester within some public services circles, and affording speedy access to information and feedback amongst others.

"Citizen satisfaction is one aspect of social sustainability that can be achieved through the application of e-governance. E-governance affords the public a voice in the way institutions are run, and this platform can be used to continuously innovate to serve the public and raise their level of satisfaction with regards to how systems work in the country. Authorities can aggregate the data on complaints, compliments, and remarks from service seekers and use it as the basis for decisions on how to improve customer experience. Empirical data on waiting time in public institutions can go a long way to shape internal processes and help optimize service delivery to the patrons." Said a participant.

What this means is that there exist the opportunity and platform for the State to broaden its impact on virtually every facet of national development, an opportunity and platform where the State invests heavily in putting in place the requisite structures for e-governance to thrive, providing e-governance services that meet the needs of the citizenry across sectors such as in healthcare delivery, education, agriculture and so much more. Speaking in Accra at the opening of a three-day International Telecommunication Union Regional Development Forum (ITU-RDF) for Africa, the Ghanaian Minister for Communications urged stakeholders to take steps to address the challenges to digital inclusion in Ghana. "We cannot limit technological advancement to only those in the urban areas, thus expand to include; all the various unserved and underserved communities in the country." (Ghanaweb, 2018). The impact of e-governance in Ghana will be far-reaching, and the benefits that have accrued to the citizenry thus far will be maximized since more public services will now be accessible in the comfort of people's homes and with a few clicks on a button.

Other specific ways e-governance can advance sustainable development per the views expressed by participants in this study include the automation of service delivery, which would increase the level of transparency and accountability in public spheres. A common theme captured in the responses to the question of how e-governance can promote sustainable development in Ghana was that of stemming the tide of corruption and making bureaucrats accountable. A participant was of the view that

"e-governance can contribute to sustainable development through automation, which increases the level of transparency and accountability in the public sphere. When e-government systems are

used in public service delivery, interference by officials is limited and monitored, which results in the prudent exercise of administrative discretion as actions can be reviewed and assessed by superior officers. When government officials work online, there will be fewer avenues for them to stall processes and frustrate clients who will have no option than to pay extra for services they are entitled to as citizens".

Administrative corruption within government could be scaled down if electronic transactions are developed to replace the human element in service delivery. Ojo (2014) notes that ICT has the potential to "enhance accountability, create awareness and ensure transparency in the management of government business." (p. 79). Reducing corruption and closely monitoring the national coffers will help prevent the hemorrhaging of public funds and ensure the availability of resources that could be invested in other sectors.

Furthermore, e-governance could be used to measure the productivity of workers and generate performance reports which can be used to evaluate the individual contributions of workers to an organization and take remedial measures, where necessary, to increase the productivity of workers. Fundamental innovations like electronic queues can help raise productivity by compiling the total number of people served by employees and the waiting time of service seekers. This data can then be used to tweak internal procedures to enhance efficiency and increase citizen satisfaction. According to a respondent to the survey, e-governance can promote sustainable development through,

"*increased productivity for both public sector employees and citizens due to the ability of electronic systems to process multiple cycles of a task. This will allow employees the time to carry out other activities while freeing up time for patrons of government services to either return to their work or spend time with their relations.*"

Also emanating from the fieldwork is the fact that the application of e-governance can be used to improve livability in the major towns and cities of Ghana. As more and more people resort to online platforms to interact with public agencies, there would be less demand for intercity/intracity shuttling, which will result in the decongestion of cities. Most of the services delivered by the government are concentrated in urban and peri-urban areas, which necessitates the movement of people to city centers to acquire some essential services like passport application, vehicle registration, among others.

"Transportation has been identified as one of the leading contributors to GHGs emissions, leading to global warming. When e-governance becomes the norm, it will contribute toward reducing the concentration of GHGs as people will be able to transact business electronically without

commuting. The current practice where government officials must move from one department/agency to another will be done away with, as information will be readily available online. This will reduce the need to commute, hence a reduction in the demand for fossil fuel. Consumers of government services will also be relieved of the burden of having to move from one government establishment to another to secure services. Where necessary, the consumer will be able to interact with multiple agencies via an online platform or from a single department/agency which will take the required customer information and make it available to other departments/agencies. This is possible when individual e-government systems are integrated" Said a participant.

Environmental sustainability is enhanced when the citizenry can interact with the state via portable handheld electronic devices or at internet cafés. Reducing the need to travel would most likely lead to a decline in the consumption of fossil fuel, thereby improving environmental sustainability and the overall livability of the country.

5.6 Broadening access to e-government services.

Improving access to the E-governance system is imperative if the country intends to use it to facilitate its sustainability agenda. E-government systems are practically becoming compulsory for the public who intend to seek some services like paying for passport application/renewal, checking of SHS placement, applying to tertiary institutions, et cetera. These new developments, aimed at encouraging the public to embrace online service in their interaction with government, need to be coupled with measures that will broaden accessibility while limiting the identified challenges. From the research, several challenges were identified concerning the use of e-governance. Of the seven suggested challenges respondents faced, poor connectivity (66%), the high cost of data (60%), and non-response from government officials (45%) were the three leading challenges associated with using in e-governance services in Ghana. Expectedly, proffered solutions included, digital literacy (75%), affordable data package (70%), stable connectivity (66%), affordable broadband services (60%), and capacity building of employees (51%). This result points to the need for the government to put in place measures that will make e-governance services not only available but to also train citizens to be comfortable with new technologies. This finding aligns with results on the adoption of e-governance in terms of placing digital literacy as the primary solution to the challenges. A study by Tchao et al. reveals that "Ghanaian consumers are highly concerned with their online privacy, and they are less willing to disclose personal

information online. Most of the respondents in this study indicated their preparedness to stay away from websites that require them to submit personal details such as bank account information and location information online" (2017, p. 162). Improving digital literacy through training programs will influence the adoption rate of e-government systems as it will help reshape attitudes which have been identified in similar studies (Dwivedi et al., 2017; Hung et al., 2013) as a significant factor in determining the adoption of e-government in a country.

Cybersecurity concern was also identified as a significant challenge to the wide-scale adoption of e-government in by a section of participants. Indeed, one FGD participant had this to say,

> "*I don't trust the robustness of the cybersecurity regime in this country. So, whatever requires my credit/debit card details is a no, no for me. I prefer to walk into the office and pay in cash.*"

This challenge of cybersecurity validates other scholarly works conducted on the issues of perceived risks associated with online transactions. Identity theft, spyware, phishing, among other concerns, have militated against the widespread adoption of e-gov. Rana et al. suggest that "e-government websites should have a third party security seals to communicate their commitment to security in line with the e-commerce systems as argued by a number of researchers" (2015, p. 137). Making the public feel safe in their online transactions is a progressive step towards breaking down the barriers to widespread adoption because cybersecurity has consistently been identified by researchers as a hindrance to the adoption of new technologies. Cyber threats have become a legitimate concern in Ghana following a series of attacks on the websites of some state institutions. In 2015, the Deputy Minister of Communications indicated that "the government portal ghana.gov was successfully attacked by a hacker known as Alsancak Tim, who is from Turkey. The hacker was able to break through 11 of the websites hosted on the portal. The CERT stated that the website was vulnerable due to failure to update software" (Cordell, 2015). If government wants to encourage the use of e-government in its interaction with the public, then it is imperative to assure citizens of their safety because trust in the safety of public online services, social influence have been identified as a prerequisite for e-government adoption in developing countries (Susanto and Aljoza, 2015; Jacobi et al., 2013; Bélanger & Carter, 2008).

E-government initiatives should be designed to attract the youth who are the most active users of the internet and modern technologies. 71% of the world's youth aged 15 – 24 are active online as opposed to 48% of the entire world's population. In developing countries, like Ghana, 67% of the youth

are active internet users (Treinen et al., 2018). Challenges involving accessibility in terms of cost, website design, and optimization for mobile phone viewing should be addressed with the youth in mind. This research has identified WhatsApp (99%) and Facebook (81%) as popular among respondents and proposes that these platforms should be an integral part of e-government interactions in Ghana.

Again, it is imperative to address challenges peculiar to gender access and safety online. Twenty-four percent of female respondents opted for face-to-face transactions over online as compared to seventeen percent of male respondents. A closer look at the survey data indicates that more females admitted to having concerns about information security and privacy online than the male respondents, which points to the need for gender-specific measures to make females comfortable online. As noted, gender-specific challenges should be "systematically addresses in the planning phase of project design and during the whole project cycle" (Treinen et al. 2018, p. 18). This could make females feel more comfortable in using e-government applications to advance their course.

Interoperability between different e-government systems should be pursued to help users experience the practical benefits of e-governance. Interoperability involves the interconnection of various ICT systems to ensure that various organizations can link up and collaborate within a digital ecosystem to solve everyday tasks (Othman and Razali, 2018). One of the advantages of e-governance is to reduce the need to travel around seeking services hence reducing cost and freeing up time for other engagements. However, the lack of wide-scale interoperability among public agencies defeats this purpose, as customers are still required to go to offices after filling forms online. Adu et al. aver that Ghana's e-governance development does not fully support online transactions "as license renewals cannot be undertaken online, the submission of bids for proposals and procurement contracts cannot be done, and ministries' records cannot be accessed online" (2018, p. 90). This is particularly disconcerting when multiple agencies are involved with varying degrees of ICT infrastructure and capacities (Narducci et al., 2016). As a necessity, the government of Ghana needs to pursue a deliberate policy to enhance the competitiveness of the ICT departments through human resources development and the provision of modern equipment. Per Othman and Razali, "Information Technology officers should have specific skills that cover various aspects of ICT such as system development, network, security, and database. These are the fundamental knowledge required for the implementation of this initiative (interoperability) at the technical level." (2017, p. 4). Building the capacity of the IT departments would be a prerequisite to the successful realization of the interoperability initiative.

6.1 CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

Introduction

This study was intended to investigate the issue of e-governance for Ghana's sustainable development. Towards this end, the study was compartmentalized into five chapters. The background of the study was presented in chapter one. In chapter two, literature relating to e-governance and sustainable development were reviewed, and conclusions were drawn. This was followed by discussions surrounding the methodology that was adopted and the conceptual framework for this study in chapter three. The methodology was followed through carefully and adjustments made where necessary. Participants were recruited, data collected, and subsequently presented and analyzed under specific themes in chapter four of the study. This chapter concludes the study by presenting the limitations associated with the study and by providing suggestions and recommendations for future research.

E-governance for sustainable development has gained traction in recent years. Many countries are seeking to improve upon the living condition of their citizens while also preserving resources for generations yet unborn. This desire to pursue a path of development that holistically confronts present challenges makes it imperative to inculcate sustainability thinking into development planning.

The use of information and communication technologies has become an integral part of the governance process in both the developed and developing economies. This study has sought to answer questions related to the contribution of e-governance to sustainable development and how to improve upon this relationship. When applied to any domain, ICT has the potential to increase inclusion and facilitate the achievement of desired goals. The study found out that respondents' experience with e-governance has generally been positive and that more people prefer interacting with government agencies online. Though challenges abound in the use of e-governance in Ghana, it remains the preferred means of interacting with government agencies for many a respondent. As more people embrace the use of e-government systems, the benefits are becoming more evident and its contributions to economic, social and environmental sustainability are increasing as well. This conclusion is further supported by the increasing number of public and private agencies that are leveraging technology to improve upon their services to the public. Virtually all Ministries, Departments and Agencies (MDAs) have active websites with some level of interaction. Electronic queries, job applications, online filling and submission of forms, as well as electronic payments are becoming a common phenomenon. A look at the

e-government services offered by public institutions points to a transition from mere online presence to the transactional phase of e-government maturity.

The use of e-government systems in the sustainable development agenda of Ghana is an idea whose time has come. The ubiquitous nature of mobile devices makes it imperative for services to be accessible online. E-government can be a tool for sustainable development, and it is imperative to establish the ways it enhances sustainability. The e-government initiatives Ghana has implemented have been relatively successful and could easily be linked to the pillars of sustainable development; economic, social, and environment. These schemes have contributed towards relieving the public of some economic burdens and social discomfort which are traditionally associated with the demand for public services. Initiatives such as the electronic renewal of health insurance, payment of utility bills, passport application, and electronic payments for goods and services are some of the initiatives that can easily be adjudged to be contributing to sustainable development. E-governance reduces the financial cost associated with seeking services for both providers and recipients. It also increases the productivity of both service providers and recipients and ensures that more is accomplished with fewer resources.

Socially, e-government contributes to sustainable development in Ghana by improving the livability of cities and towns. Online transactions help to reduce the need to commute with its incidental costs to individuals and society at large. When information and services are readily accessible online, it promotes social inclusion as more people will be able to access information and services, and act upon it in real-time. It is evident from the study that the speed with which services are delivered enhances the general wellbeing of citizens and increases leisure. The study also acknowledges the contribution of e-government towards environmental sustainability in Ghana. E-governance ensures that services that were previously accessible through physical presence can be accessed remotely. As a result, those seeking such services will not need to commute and hence, a reduction in transportation and the demand for fossil fuel. The cumulative effect of the reduction in fossil fuel could be a reduction in the concentration of GHGs in the atmosphere.

Given the myriad of challenges identified in this and other related works on e-governance, this study looked at ways of overcoming the challenges in order to increase the adoption of e-governance. Most of the e-government initiatives have been fronted by the government and private institutions to enhance the quality of their services. In order to achieve this, steps should be taken to address the critical infrastructural deficit and increase digital literacy among the general public. Connectivity and cost

challenges could be resolved with the deployment installation of state-of-the-art infrastructure/technology which would enhance user experience. This could drive down the cost associated with providing and accessing e-government services in the country. A positive experience with e-government would attract the public to have faith in these systems, which will make citizens amenable to upgrading their ICT skills.

The study also established that the decision of the government to make some public agencies offer their services online had encouraged the use of e-governance. Left with no option, citizens have come to appreciate the imperative nature of e-governance through the compulsory usage of e-government applications. This has resulted in less crowding and wandering around such organizations as services are only delivered to those with prior appointments. The cumulative benefits of these policies will become evident with time.

6.2 Limitations

This study was limited to the state of e-governance in Ghana and its role in the sustainable development of Ghana. The researcher explored the experience of the citizens, businesses, and employees in their interaction with public agencies through various online portals. Efforts were devoted to finding the success factors in the implementation of e-governance by some developed countries and valuable lessons that can be applied to boost Ghana's sustainable development. The study mainly explored the experience of South Korea in e-governance and offered suggestions for Ghana. This study also took on the views of end-users of e-governance services, who are the major stakeholders. Lastly, this study was an attempt to identify and establish a nexus between e-governance and sustainable development in Ghana.

Owing to time and other resource constraints, the study only took on board the views of a cross-section of residents, business owners, and government employees in Ghana. This study was initially intended to be a qualitative study in the main, employing both FGDs and in-depth interviews to explore and not to generalize. However, owing to certain constraints, in-depth interviews were dropped, and questionnaires administered. Thus, this study essentially adopted a mixed approach (employing both quantitative and qualitative approaches) to the study throughout the implementation stage.

6.3 Future Research

Since the researcher had to, at some point rescind his initial decision and plan to conduct in-depth interviews, mainly because of time constraints, it is recommended for future research that a more robust qualitative study that incorporates in-depth interviews be conducted on the same issue of e-governance for sustainable development in Ghana.

It is also suggested that future studies into this subject of e-governance in Ghana take on board the relevant government representatives such as the Minister of Communications and her deputy, officials from that ministry, and other relevant state agencies as respondents. The views of stakeholders of this caliber are critical to investigations into e-governance in Ghana.

The sample size for the current study was relatively small. It is imperative that future research into this area of interest recruits a lot more respondents and increases the sample size considerably, especially when a quantitative approach is adopted.

It is suggested that future research focuses on investigating in greater depth how best Ghana can adopt, adapt and leverage on e-governance to advance sustainable development within the context of its peculiar cultural, social and geographical settings

It is also recommended for future research that investigations be conducted (also a qualitative study) solely on the extent to which Ghana has thus far leveraged on e-governance for sustainable development. The focus should be on assessing the current status of Ghana's deployment of e-governance. This could also be a comparative study between Ghana and other African countries.

6.4 Recommendations

Based on the realities and findings from the primary and secondary data assembled and analyzed early on in this study, the following recommendations are proposed. These recommendations are intended to be applied at the national and local government levels as Ghana strives to broaden its decentralization efforts.

6.4.1 National Level

It is imperative for the state to draw a comprehensive policy framework and develop a national e-governance policy, informed in part by lessons learned from the success stories of countries such as Denmark, Australia, and South Korea, and aimed at facilitating sustainable development on the back of e-governance. Such a policy could be an integration of the several ICT policies of the various MMDAs to ensure that regional aspirations are captured in the national policy document. This proposed policy document should be designed to ensure that e-governance contributes to sustainable development. Every e-government project should be designed to promote good governance, economic, social, and environmental sustainability in the country. This comprehensive e-governance policy framework must touch on virtually every facet of Ghana's developmental need (healthcare, agriculture, education, social services, and several others) and must have the buy-in of the technocrats and the nation at large.

For the success of a national e-government for sustainable development policy, there is the need to train and orient public sector employees who will be expected to handle the day-to-day operations of the system. E-government will potentially alter the role of civil servants in service delivery, and it is pertinent that they are comfortable with it and understand the nuances. It has been suggested that "discussions with public servants should be conducted in order to improve their understanding of the e-Government project, persuade them, and to prevent them from having objections to the changes in job environment. Also, training programs that can help them familiarize with the e-Government systems should be included." (Lee, 2012, p. 130). The South Korean experience is a manifestation of the centrality of skill development and continuous training to the success of e-governance.

It is recommended that the state explores viable ways and means of helping ensure that the cost of internet connectivity is relatively modest and that, internet service providers are given some stimulus packages when they demonstrate significant improvements in the provision of speedy internet connectivity services.

6.4.2 Local Government Level

At the local government level, the state should demand and assist in the setting up of robust ICT departments to serve the peculiar needs of their catchment areas. Such a department could also be used as the workforce to train students and workers to become technologically inclined and introduce new e-

government initiatives to the public. ICT clinics and booth camps could be used to attract the public to enroll in free or subsidized training programs. These sessions could be used to introduce the concept of sustainable development and the need to embrace technology in the promotion of sustainable development.

Again, MMDAs in Ghana should be empowered to train a targeted percentage of the people within their jurisdiction in basic ICT skills. Digital literacy is a condition precedent for the adoption of e-government, and if citizens are not abreast of ICT, they will not be enthralled by his usefulness. In Korea, the government took steps to train twenty-one percent of the population in ICT within a two-year duration (2000 - 2002). The government also took steps to make available digital equipment at subsidized rates to the citizen to increase the demand for ICT (Lee, 2015). The various MMDAs should implement free or subsidized training programs to build-up the digital literacy of the public. Such an initiative at the local government level will whip up interest and prod the public towards the use of e-government applications.

The citizenry must be brought on board. State agencies responsible for the dissemination of information to the citizenry must engage in continual and consistent communications campaigns to educate the populace about the various state-provided online services available to citizens, the benefits therein, and how they can be assessed. The State should consider providing incentives/rewards to citizens who opt to access public services online. These could be in the form of discounts on service charges, enhanced speed of processing, and efficient service delivery, among others.

6.4.3 Implementation Mechanism

The implementation of such a technically and technologically inclined policy requires the recruitment of people with the relevant skillset to manage the enormous volume of data and maintain system security. It is thus recommended that the State conscientiously recruits a critical mass of talents with the requisite skill set in the areas of computer programming, data mining, artificial intelligence, machine learning, and systems analysis, among others. Where these skills are in short supply, the State should facilitate the training of ICT graduates with demonstrable potential to fill in the skills gap. The Ministry of Communications could use NITA, and other agencies help to set up a standardized training course for public servants who are not technologically savvy, and the successful completion of the training should be made a prerequisite for promotion within the public service. This drive must not only be sustained but must be strengthened and pursued with much vigor and urgency.

Undertaking a comprehensive e-governance for a sustainable development program is an extremely expensive venture for Ghana. There should be a dedicated stream of funds to support the implementation of national e-government for sustainable development policy and campaigns to encourage the adoption of e-governance. It is advised that the government should devote a certain percentage of its revenue towards the implementation of a national e-government for a sustainable development program. This percentage could be scaled down or taken off after the desired results have been achieved. In this vein, the government of Ghana could learn from the successful financing model used by the South Korean government. "Investment in information, data, software, and other infrastructure for e-government was made solely with government funding, as was their operation. The Informatization Promotion Fund was built up from profits made by telecommunications operators instead of foreign capital." (Karippacheril et al., 2016, p. 57). Local governments could also be encouraged to use a portion of their internally generated funds to support the implementation of e-governance for sustainable development within their jurisdiction. Additionally, as a temporary measure, a special tax could also be levied on some luxury or 'harmful' goods and services to raise capital to accelerate the transition to e-governance and finance the campaign for the adoption of e-governance.

REFERENCES

Achampong, E. K. (2012). The state of information and communication technology and health informatics in Ghana. *Online journal of public health informatics*, *4*(2).

Adeyemo, A. B. (2011). E-government implementation in Nigeria: An assessment of Nigeria's global e-gov ranking. *Journal of Internet and Information Systems*, *2*(1), pp. 11-19.

Adu, K. K., Patrick, N., Park, E. G., & Adjei, E. (2018). Evaluation of the implementation of electronic government in Ghana. *Information Polity, 23*(1), 81-94. doi:10.3233/IP-170420

Alaaraj, H., & Ibrahim, F. W. (2014). An overview and classification of e-readiness assessment models. *International Journal of Scientific and Research Publications*, *4*(12), pp. 1-5.

Alateyah, S., Crowder, R. M., & Wills, G. B. (2013). Factors affecting the citizen's intention to adopt e-government in Saudi Arabia. *International Journal of Social, Human Science and Engineering*, *7*(9), pp. 80-85.

Alhaddi, H. (2015). Triple bottom line and sustainability: A literature review. *Business and Management Studies,* 1(2), pp. 6-10.

Alharbi, N., Papadaki, M., & Dowland, P. (2014). Security Factors Influencing End Users 'Adoption of E-Government. *Journal of Internet Technology and Secured Transactions (JITST), 3*(4), pp. 320-328.

Al-Khouri, A. M. (2011). An innovative approach for e-government transformation. *International Journal of Managing Value and Supply Chains (IJMVSC)*, 2(1), pp. 22-43.

Alshibly, H., & Chiong, R. (2015). Customer empowerment: Does it influence electronic government success? A citizen-centric perspective. *Electronic Commerce Research and Applications*, *14*(6), pp. 393-404.

Andersen, K. V., & Henriksen, H. Z. (2006). E-government maturity models: Extension of the Layne and Lee model. *Government Information Quarterly*, *23*(2), 236–248. Retrieved November 5, 2018 from https://doi.org/10.1016/j.giq.2005.11.008

Ashby, M. F. (2012). *Materials and the environment: Eco-informed material choice* (2nd ed.). Elsevier.

Babbie, E. (2006). *The basics of social research*. Belmont, California: Thomson Wadsworth.

Backus, M. (2001). E-governance and developing countries, introduction and examples. *International Institute for Communication and Development (IICD).*

Bélanger, F. & Carter, L. (2008). Trust and risk in e-government adoption. *The Journal of Strategic Information Systems,* 17(2), 165–176. https://doi.org/10.1016/j.jsis.2007.12.002

Bose, R., (2004). *Information technologies for education & training in e-government.* In International Conference on Information Technology: Coding and Computing, 2004. Proceedings ITCC 2004. (Vol. 2, pp. 203-207). IEEE.

Boyatzis, R. E. (1998). *Transforming qualitative information: thematic analysis and code development.* Thousand Oaks: Sage Publications.

Brancati, D. (2018). *Social scientific research.* California: Sage Publications.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. Retrieved November 5, 2018 from doi:10.1191/1478088706qp063oa

Carbo, T. & Williams, J. G. (2004). Models and metrics for evaluating local electronic government systems and services. *Electronic Journal of e-government*, *2*(2), pp. 95-104.

Centeno C., van Bavel R. & Burgelman, J. C. (2005). A prospective view of e-government in the European Union. *The Electronic Journal of e-Government* 3 (2), pp. 59-66.

Cheshmehzangi, A., & Dawodu, A. (2018). *Sustainable Urban Development in the Age of Climate Change: People: The Cure Or Curse.* Springer.

Chowdhury, M. M. H., & Satter, A. Z. (2013). Citizen perspective e-governance model for developing countries: Bangladesh Context. *American Journal of Modeling and Optimization*, *1*(3), pp. 43-46.

Clarkson, L., Morrissette, V., & Régallet, G. (1992). *Our responsibility to the seventh generation: Indigenous peoples and sustainable development.* Winnipeg: International Institute for Sustainable Development.

Cordella, D. (2015, February 28). Cyber attacks in West Africa sparks IT debates. Retrieved 30 September, 2019 from https://hacked.com/cyber-attacks-west-africa-spark-debates/

Danfulani, J. (2013). *E-governance: A weapon for the fight against corruption in Nigeria*. Retrieved November 5, 2018 from http://saharareporters.com/2013/08/10/e-governance-weapon-fight-against-corruption-nigeria-john-danfulani-phd

De Wulf, L., & Sokol, J. B. (Eds.). (2004). *Customs modernization initiatives: Case studies.* Washington, DC: The World Bank.

Dobson, A. (1996). Environment sustainabilities: An analysis and a typology. *Environmental Politics*, *5*(3), pp. 401-428.

Dwivedi, Y. K., Rana, N. P., Janssen, M., Lal, B., Williams, M. D., & Clement, M. (2017). An empirical validation of a unified model of electronic government adoption (UMEGA). *Government Information Quarterly*, 34(2), 211-230. doi:10.1016/j.giq.2017.03.001

EIU. (2006). The 2006 e-readiness rankings. London: The Economist Intelligence Unit & the IBM Institute for Business Value. Retrieved February 1, 2019 from http://graphics.eiu.com/files/ad_pdfs/2006Ereadiness_Ranking_WP.pdf

Elkington, J. (1994). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. *California management review*, *36*(2), pp. 90-100.

Elkington, J. (2013). Enter the triple bottom line. In *The triple bottom line* (pp. 1-16). Routledge.

Estevez, E., & Janowski, T. (2013). Electronic Governance for Sustainable Development—Conceptual framework and state of research. *Government Information Quarterly*, 30, pp. 94-109.

Estevez, E., Janowski, T., & Dzhusupova, Z. (2013, June). Electronic governance for sustainable development: how EGOV solutions contribute to SD goals?. In *Proceedings of the 14th Annual International Conference on Digital Government Research* (pp. 92-101). ACM.

Etim A (2011). Bottom-up business development: Empowering low income societies through microfinance and mobile technologies. *International Journal of Humanities and Social Sciences* 1 (13) 1-11

Fang, Z. (2002). E-government in digital era: concept, practice, and development. *International journal of the Computer, the Internet and management*, 10(2), pp. 1-22.

Florini, A., & Pauli, M. (2018). Collaborative governance for the sustainable development goals. *Asia & the Pacific Policy Studies*, *5*(3), 583-598. ,:10.1002/app5.252

Goel, P. (2010). Triple Bottom Line Reporting: An Analytical Approach for Corporate Sustainability. *Journal of Finance, Accounting & Management*, *1*(1).

Hammer, J., & Pivo, G. (2017). The triple bottom line and sustainable economic development theory and practice. *Economic Development Quarterly*, *31*(1), pp. 25-36.

Harper, D., & Thompson, A. R. (Eds.). (2011). *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners.* John Wiley & Sons.

Heeks, R. (2001). *Understanding e-governance for development.* Manchester: Institute for Development Policy and Management.

Henriques, A. (2013). CSR, sustainability and the triple bottom line. In *The Triple Bottom Line* (pp. 48-55). Routledge.

Hiller, J. S., & Bélanger, F. (2001). Privacy strategies for electronic government. *E-government*, *200*, 162-198.

Horn, R. (2009). Researching and Writing Dissertations: A complete guide for business and management students, Chartered Institute of Personnel and Development.

Hung, S., Chang, C., & Kuo, S. (2013). User acceptance of mobile e-government services: An empirical study. *Government Information Quarterly*, 30(1), 33-44. doi:10.1016/j.giq.2012.07.008

Independent Evaluation Group (2016). *Republic of Ghana: eGhana project (English).* Washington, D. C.: The World Bank Group. Retrieved from http://documents.worldbank.org/curated/en/160891483464903876/Republic-of-Ghana-eGhana-project

Jacobi, A., Jensen, M., Kool, L., Munnichs, G. & Weber, A. (2013). Security of e-government systems. European parliament. Retreived 30 August 2019 http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/513510/IPOL-JOIN_ET(2013)513510_EN.pdf

Jaeger, P. T., & Bertot, J. C. (2010). Designing, implementing, and evaluating user-centered and citizen-centered E-government. *International Journal of Electronic Government Research*, *6*(2), pp. 1-17. Retrieved February 1, 2019 from doi:10.4018/jegr.2010040101

Joffe, H. (2012). Thematic analysis. *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners*, *1*, pp. 210-223.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, *33*(7), pp. 14-26.

Johnson, J. B., Reynolds, H. T., & Mycoff, J. D. (2016). *Political science research methods* (8th ed.). Thousand Oaks, California: CQ Press, an imprint of SAGE Publications, Inc.

Kanaan, R. K., (2009). Making sense of e-government implementation in Jordan: A qualitative investigation. De Montfort University Doctoral Theses. Retrieved from: https://www.dora.dmu.ac.uk/bitstream/handle/2086/2415/Thesis.pdf.

Karippacheril, T. G., Kim, S., Beschel Jr, R. P., & Choi, C. (Eds.). (2016). *Bringing Government into the 21st Century: The Korean Digital Governance Experience*. The World Bank.

Karkin, N., & Janssen, M. (2014). Evaluating websites from a public value perspective: A review of Turkish local government websites. *International Journal of Information Management*, *34*(3), pp. 351-363.

Keping, Y. (2018). Governance and Good Governance: A New Framework for Political Analysis. *Fudan Journal of the Humanities and Social Sciences*, *11*(1), 1-8.

Khan, M. A. H. (2017). E-readiness of public administration in developing countries: A case study on Bangladesh public administration.

Krueger, R. A., & Casey, M. A. (2014). *Focus groups: A practical guide for applied research*. Sage publications.

Kumar, T. V. (2015). E-governance for smart cities. In *E-governance for smart cities* (pp. 1-43). Springer, Singapore.

Lea, D., & Oxford University Press. (2011). *Oxford advanced American dictionary for learners of English*. New York; Oxford; Oxford University Press.

Lee, Y. B. (2012). 2011 Modularization of Korea's Development Experience: The Introduction of E-Government in Korea. *Korea Development Institute (KDI) School of Public Policy and Management research paper.* Seoul: Ministry of Strategy and Finance (MOSF).

Lee, Y. H. (2015). ICT as a key engine for development: Good practices and lessons learned from Korea. *World Bank note. Washington, DC: World Bank.* Retrieved May 5, 2019 from http://siteresources. worldbank. org/INTEGOVERNMENT/Resources/NoteKoreaICT. doc.

Mahmoodi, R. K., & Nojedeh, S. H. (2016). Investigating the Effectiveness of E-government Establishment in Government Organizations. *Procedia-Social and Behavioral Sciences*, *230*, 136-141.

Mayring, P. (2007). Introduction: Arguments for mixed methodology. In Mayring, P., Huber, G. L., Gurtler, L. & Kiegelmann, M. (Eds.), *Mixed methodology in psychological research*. Rotterdam/Taipei: Sense Publishers.

Mayer-Schönberger, V., & Lazer, D. (2007). *Governance and information technology: From electronic government to information government*. Cambridge, Mass: MIT Press.

McClure, D. L. (2001). *Electronic government: challenges must be addressed with effective leadership and management*. General Accounting Office.

Mensah, I. K. (2016). Overview of e-government adoption and implementation in Ghana. *World Academy of Science, Engineering and Technology, International Science Index 109, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, *10*(1), pp. 61-72.

Mergel, I., & Bretschneider, S. I. (2013). A three-stage adoption process for social media use in government. *Public Administration Review*, *73*(3), pp. 390-400.

Meyerhoff N. M. (2016) 'E-governance and stage models: analysis of identified models and selected Eurasian experiences in digitising citizen service delivery', Electronic Government. *An International Journal*, *12*(2), pp. 107–141.

Meyer, B., & Wiegandt, K. (2009). *Costing the earth? Perspectives on sustainable development*. London: Haus

Moon, M. J. (2002). The evolution of E-government among municipalities: Rhetoric or reality? *Public Administration Review*, 62(4), 424-433. doi:10.1111/0033-3352.00196

Ministry of Health (2010). *Ghana eHealth Policy*. Accra: Ghana

Mutula, S. M. (2010). E-Readiness Assessment Methods and Tools. In S. Mutula (Ed.), *Digital Economies: SMEs and E-Readiness* (pp. 87-110). Hershey, PA: Business Science Reference.

Narducci, F., Comerio, M., Batini, C., & Castelli, M. (2016). A similarity-based framework for service repository integration. *Data & Knowledge Engineering*, *106*, 18-35.

National Information Technology Agency (n.d.). *Ghana*. Retrieved February 10, 2019 from https://nita.gov.gh/about-us.

National Information Technology Agency (2017). *Ghana*. Retrieved from February 18, 2019 https://nita.gov.gh/projects/jurong-logistics-hub/

Ndou, V. (2004). E–Government for developing countries: opportunities and challenges. *The electronic journal of information systems in developing countries*, *18*(1), pp. 1-24.

Njuru, J. (2011). Implications of E-Government on Public Policy and Challenges of Adopting Technology: The case of Kenya, *Journal of global affairs and public policy volume 1, number 1*

OECD. (2006). The challenge of capacity development: Working towards good practice. OECD Papers, 6(1), 1-37. doi:10.1787/oecd_papers-v6-art2-en

OECD (2016), *Open Government: The Global Context and the Way Forward*, OECD Publishing, Paris, https://doi.org/10.1787/9789264268104-en.

Ojo, J. S. (2014) "E-Governance: An imperative for sustainable grass root development in Nigeria". *Journal of Public Administration and Policy Research*. 6 (4): 77 – 89.

O'Neil, J. (2018). 'People, Planet, Profits' and Perception Politics: A Necessary Fourth (and Fifth) Bottom Line? Critiquing the Current Triple Bottom Line in the Australian Context. In *The Goals of Sustainable Development* (pp. 19-42). Springer, Singapore.

Opoku, A. R. (2003). Ghana and ICT: Strides, Challenges and the way forward. Retrieved from February 9, 2019 https://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=54098

Ortiz, A., & Taylor, P. (2009). *Learning purposefully in capacity development: Why, what and when to measure? Rethinking capacity development.* Paris: International Institute for Educational Planning (IIEP).

Osei-Kojo, A. (2017). E-government and public service quality in Ghana: How e-government is improving the quality of public service in Ghana. *Journal of Public Affairs, 17*(3). Accessed February 9, 2019 from e1620. doi:10.1002/pa.1620

Othman, M. H., & Razali, R. (2018). Whole of government critical success factors towards integrated e-government services: A preliminary review. *Jurnal Pengurusan (UKM Journal of Management)*, *53*.

Othman, M. H., & Razali, R. (2017). Electronic government systems interoperability model. *Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, *9*(3-4), 1-9.

Owusu-Ansah, S. (2014). Human Factor Issues In The Use Of E-Government Services Among Ghanaian Middle Age Population: Improving Usability Of Existing And Future Government Virtual Interactive Systems Design.

Patton, M. Q. (2002). *Qualitative research and evaluation methods (3rd ed.).* Thousand Oaks, California: Sage Publications.

Piehler, R., Wirtz, B. W., & Daiser, P. (2016). An analysis of continuity intentions of eGovernment portal users. *Public Management Review*, *18*(2), pp. 63-198.

PIWA & UNDP (2011). *E-governance and Citizen Participation in West Africa: Challenges and Opportunities*, 102. Retrieved February 9, 2019 from http://www.undp.org/content/dam/undp/library/Democratic%20Governance/IParticipation/e-Governance%20and%20Citizen%20Paticipation%20in%20West%20Africa%20(UNDP-IPAO%20Report%20English).pdf

Quaynor, N., Tevie, W. & Bulley, A. (1997). *Expansion of the Internet backbone in Ghana*. Accra, Ghana: Network Computer Systems. Retrieved April 14, 2019 from http://www.isoc.org/inet97/proceedings/E5/E5_2.HTM

Rana, N. P., Dwivedi, Y. K., Lal, B., Williams, M. D., & Clement, M. (2017). Citizens' adoption of an electronic government system: towards a unified view. *Information Systems Frontiers*, *19*(3), 549-568.

Rana, N. P., Dwivedi, Y. K., Williams, M. D., & Weerakkody, V. (2015). Investigating success of an e-government initiative: Validation of an integrated IS success model. *Information Systems Frontiers,* 17(1), 127-142. doi:10.1007/s10796-014-9504-7

Republic of Ghana. (2003). The Ghana ICT for accelerated development (ICT4AD) policy. Retrieved February 9, 2019 from https://www.moc.gov.gh/sites/default/files/downloads/Ghana-ICTAD%20Policy-Master-final-2.pdf.

Sachs, J. D. (2015). *The age of sustainable development*. Columbia University Press.

Sathaye, J., O. Lucon, A. Rahman, J. Christensen, F. Denton, J. Fujino, G. Heath, S. Kadner, M. Mirza, H. Rudnick, A. Schlaepfer, A. Shmakin (2011). Renewable Energy in the Context of Sustainable Energy. In IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Saunders, M., Lewis, P. and Thornhill, A., (2012). Research methods for Business students, 6th Edition: Harlow: Pearson Education

Siau, K., & Long, Y. (2005). Synthesizing e-government stage models - a meta-synthesis based on meta-ethnography approach. *Industrial Management & Data Systems*, 105(4), 443-458. doi:10.1108/02635570510592352

Smith, A., Voß, J., & Grin, J. (2010). Innovation studies and sustainability transitions: The allure of the multi-level perspective and its challenges. *Research Policy,* 39(4), 435-448. doi:10.1016/j.respol.2010.01.023

Stringer, E. T. (2014). *Action research (4th ed.).* Thousand Oaks, California: Sage Publications.

Susanto, T. D., & Aljoza, M. (2015). Individual acceptance of e-Government services in a developing country: Dimensions of perceived usefulness and perceived ease of use and the importance of trust and social influence. *Procedia Computer Science, 72*, 622-629

Taylor, J. A., & Lips, A. M. B. (2008). The citizen in the information polity: Exposing the limits of the e-government paradigm. *Information Polity*, 13(3,4), 139-152. doi:10.3233/IP-2008-0163

Tchao, E. T., Diawuo, K., Aggor, C. S., & Kotey, S. D. (2017). Ghanaian Consumers Online Privacy Concerns: Causes and its Effects on E-Commerce Adoption*. International Journal of Advanced Computer Science and Applications,* 8(11), 157-163 Retrieved June 6th, 2019 from https://arxiv.org/ftp/arxiv/papers/1801/1801.01086.pdf

Tomislav, K. (2018). The Concept of Sustainable Development: From its Beginning to the Contemporary Issues. *Zagreb International Review of Economics & Business*, *21*(1), pp. 47-74.

Ubels, J., Acquaye-Baddoo, N.-A., & Fowler, A. (Eds.). (2010). *Capacity Development in Practice.* London: Earthscan.

UNCED/Rio Declaration on Environment and Development (1992) U.N. Doc. A/CONF.151/26 (1). Retrieved April 23, 2019 from https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf

UN Department of Economic and Social Affairs, UNDESA. (2003). *World Public Sector Report 2003: E-Government at the Crossroads.* Available at https://publicadministration.un.org/publications/content/PDFs/E-Library%20Archives/World%20Public%20Sector%20Report%20series/World%20Public%20Sector%20Report.2003.pdf

UN Department of Economic and Social Affairs, UNDESA. (2015). *E-government for sustainable development:Report of the expert group meeting.* Retrieved February 28 2019 from http://workspace.unpan.org/sites/Internet/Documents/UNPAN97131.pdf

United Nations E-Government Survey., 2014. E-Government Survey 2014. Retrieved from:<http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/ E-Gov_Complete_Survey-2014.pdf>.

UN Global e-government readiness report (2004). Towards access for opportunity. Retrieved February 18, 2019 from https://publicadministration.un.org/egovkb/portals/egovkb/Documents/un/2004-Survey/Complete-Survey.pdf

UN Survey. (2016). UN e-Government Survey 2016 ranks Mauritius 1st in Africa. Retrieved November 15, 2018 from http://www.govmu.org/English/News/Pages/UN-e-Government-Survey-2016-ranks-Mauritius-1st-in-Africa.aspx.

UN Survey (2018). *UN E-government Survey 2018.* Retrieved February 18, 2019 from https://www.unescap.org/sites/default/files/EGovernment%20Survey%202018_FINAL.pdf

United Nations (2005). 2005 World Summit Outcome. Resolution Adopted by the General Assembly. A/RES/60/1, United Nations, New York, USA.

United Nations (Ed.). (2008). *United Nations e-government survey 2008: From e-government to connected governance.* New York: United Nations.

Ursula Owusu Ekuful (2018). *Take deliberate steps to address technological gap.* Retrieved 11, August 2019 from https://www.ghanaweb.com/GhanaHomePage/NewsArchive/Take-deliberate-steps-to-address-technological-gap-Ursula-Owusu-670032

Veit, D., & Huntgeburth, J. (2014). *Foundations of digital government. Leading and Managing in the Digital Era.* Heidelberg: Springer.

Verkijika, S. F., & De Wet, L. (2018). E-government adoption in Sub-Saharan Africa. *Electronic Commerce Research and Applications,* 30, 83-93. doi:10.1016/j.elerap.2018.05.012

Merriam-Webster, Inc. (1985). Merriam-*Webster's advanced learner's English dictionary*. Springfield, Mass: Merriam-Webster.

Merriam-Webster, Inc. (1985). *Webster's ninth new collegiate dictionary*. Springfield, Mass: Merriam-Webster.

World Bank (2016). Project Performance Assessment Report. Republic of Ghana e-Ghana Project. Retrieved February 18, 2019 from http://documents.worldbank.org/curated/en/160891483464903876/pdf/108359-PPAR-P157755-PUBLIC.pdf

World Commission on Environment and Development. (1987). *Our common future.* New York;Oxford;: Oxford University Press.

World Economic Forum (2016). *Networked readiness index*. Retrieved February 18, 2019 from http://reports.weforum.org/global-information-technology-report-2016/economies/#indexId=NRI&economy=GHA

World Economic Forum. (2015). The global information technology report 2015. ICTs for inclusive growth. Retrieved from http://www3.weforum.org/docs/WEF_Global_IT_Report_2015.pdf

Zakaria, M. R. (2015). Towards categorizing e-government services: The case of Egypt. International Journal of Business Research and Development, 3(3). https://doi.org/10.24102/ijbrd.v3i3.546

Zhang, H., Xu, X., & Xiao, J. (2014). Diffusion of e-government: A literature review and directions for future directions. Government Information Quarterly, 31(4), 631-636.

Code Frame for Qualitative Data Analysis

THEME	CODE	DESCRIPTION
Meaning of E-governance	**MG**	What e-governance means to participants
E-Governance Services Available	**ESA**	E-governance services are currently available for the public
E-governance Services Used	**ESU**	The e-governance services participants have personally used
Transactions Type Preference	**TTP**	Participants` preference of one transaction type over the other (either electronic or face-to-face transactions) and what informed such a preference
Benefits of E-governance in Ghana	**BEG**	What participants consider as the benefits of e-governance in Ghana?
Shortcomings of E-governance in Ghana	**SEG**	What participants considered to be the shortcomings of e-governance in Ghana?
Suggestions for Improvement	**SI**	Participants' views regarding what can be done to improve e-governance services in Ghana
Advancing Sustainable Development through e-governance	**ASDE**	The views of respondents with respect to how e-governance contributes to advancing sustainable development with specific focus on the economic, social, environmental, governance dimensions)
Challenges in the implementation	**CI**	Views about the challenges in implementing e-government for sustainable development
E-governance success stories from elsewhere	**ESSE**	Participants` narration of any success stories of e-governance outside Ghana they may be privy to and their views on why they consider such cases success stories.
Lessons from success stories	**LSS**	Participants` views on lessons Ghana can learn from the successes of other countries.

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

To: Gabriel Alhassan

Cc: Muhammad Khaled

From: Atta Gebril, Chair of the IRB

Date: Feb 6, 2019

Re: Approval of study

This is to inform you that I reviewed your revised research proposal entitled
 "**E- GOVERNANCE FOR GHANA'S SUSTAINABLE DEVELOPMENT: LESSONS FROM SOUTH
KOREA**" and determined that it required consultation with the IRB under the "expedited"
category. As you are aware, the members of the IRB suggested certain revisions to the
original proposal, but your new version addresses these concerns successfully. The revised
proposal used appropriate procedures to minimize risks to human subjects and that adequate
provision was made for confidentiality and data anonymity of participants in any published
record. I believe you will also make adequate provision for obtaining informed consent of the
participants.

This approval letter was issued under the assumption that you have not started data collection
for your research project. Any data collected before receiving this letter could not be used
since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an
Egyptian government agency responsible for approving some types of off-campus research.
CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Ashraf
Hatem. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no
responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a
year, you need to apply for an extension.

Thank you and good luck.

Dr. Atta Gebril

IRB chair, The American University in Cairo
2046 HUSS Building
T: 02-26151919
Email: agebril@aucegypt.edu

Institutional Review Board
The American University in Cairo AUC Avenue, P.O. Box 74

The American University in Cairo AUC Avenue, P.O. Box 74 New Cairo 11835, Egypt.
tel 20.2.2615.1000
fax 20.2.27957565
Email: aucirb@aucegypt.edu
                                      February 6, 2019

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

Documentation of Informed Consent for Participation in Research Study

Project Title: *Implications and Imperatives of e-governance for Sustainable Development in Ghana: Issues and Prospects.*

Principal Investigator: *Gabriel Alhassan.*

Mobile: +20 109 772 0759/ +233 24 452 7775

*You are being asked to participate in a research study. The purpose of the research is to *explore the, Implications and Imperatives of E-governance for Sustainable Development in Ghana: Issues and Prospects.* The findings may be *published, presented, or both*. The expected duration of your participation is *an hour*.

The procedures of the research will be as follows; *a brief introduction of the research objectives followed by a discussion of issues related to personal and collective experience and opinions regarding e-governance service and its relation to sustainable development in Ghana.*

*This discussion will be audio recorded for transcription purposes.

*There *will not be* certain risks or discomforts associated with this research.

*There *will not be* benefits to you from this research.

* The information you provide for purposes of this research *is confidential. Any data/information received will be destroyed three years after the completion of the study.*

**Questions about the research, rights of participants, or research-related injuries should be directed to Gabriel Alhassan at +20 109 772 0759 / +233 24 452 7775.*

*Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

Signature   _____

Printed Name   _____

Date   _____

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

Documentation of Informed Consent for Participation in Research Study

Project Title: *Implications and Imperatives of E-governance for Sustainable Development in Ghana: Issues and Prospects.*

Principal Investigator: *Gabriel Alhassan.*

Mobile: +20 109 772 0759/ +233 24 452 7775

*You are being asked to participate in a research study. The purpose of the research is to *study the implications and imperatives of E-governance for sustainable development in Ghana: issues and prospects*. The findings may be *published, presented, or both*.

I am inviting you to participate in this research study by completing the attached survey which will take about 15 minutes to complete.

*There *will not be* certain risks or discomforts associated with this research.

*There *will not be any benefits* to you from this research.

*The information you provide for purposes of this research *is confidential. Any data/information received will be destroyed three years after the completion of the study.*

**Questions about the research, rights of participants, or research-related injuries should be directed to Gabriel Alhassan at +20 109 772 0759 / +233 24 452 7775.*

*Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

Signature   _____

Printed Name   _____

Date   _____

You are hereby invited to take part in this study which aims at finding how E-governance promotes sustainable development in Ghana. You are humbly requested to contribute to the success of the study by taking time off to complete this questionnaire. Please be assured that the research is for academic purpose thus no identifying information is sought.

1. Age
    [ ] 18 – 25   [ ] 26 – 35   [ ] 36 – 45

    [ ] 46 – 55   [ ] 56 – 65   [ ] Over 65

2. Gender   [ ] Male   [ ] Female

3. Highest level of education   [ ] High School   [ ] Technical/vocational
    [ ] Bachelor   [ ] Masters   [ ] Doctorate

4. **Occupation**
    [ ] Public sector employee   [ ] Private sector employee   [ ] Business person
    [ ] Student   [ ] Unemployed
    Others:……………………………………………..

5. **What does e-governance (electronic governance) mean to you?**
    ....
    ....
    ....

6. **Which of the following do you prefer?**
    [ ] Online transaction   [ ] Face-to-face transaction

7. **Which of the following applications have you used within the past 7 days?** *(check all that apply)*
    [ ] Whatsapp   [ ] Skype   [ ] Facebook   [ ] Twitter   [ ] Instagram   [ ] Viber

    [ ] Email app   [ ] Others:………………………………………………….

8. **Which of the following e-government services have you personally used?** *(check all that apply)*
    [ ] Passport application   [ ] Business registration

    [ ] Ghana Post GPS   [ ] School placement

    [ ] Driver's license registration/renewal   [ ] e-payslip

    [ ] e-payment service   [ ] GCNet

    [ ] Taxpayer Identification Number (TIN)   Others:………………………

9.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
E-governance is beneficial to you	[ ]	[ ]	[ ]	[ ]	[ ]
E-governance contributes to sustainable development					

10. In what ways does e-governance contribute to Ghana's sustainable development?

....

....

....

....

11. What challenges do you face in using e-government services?

[ ] Unfamiliarity with the system   [ ] High cost of data   [ ] Poor connectivity

[ ] Information security issues   [ ] Poor website design   [ ] Absence of local language

[ ] Lack of trust (non-response)   Others:………………………….

12. How do you think e-government services can be improved in the future?

[ ] Digital literacy   [ ] Privacy & security   [ ] Localizing content

[ ] Affordable broadband services   [ ] Affordable data packages   [ ] Public hotspots

[ ] Capacity building (employees)   [ ] Stable connectivity   [ ] Multiple languages

[ ] User-friendly websites design

13.

To what extent do you agree that e-governance contribute to	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Economic development					
Social development?					
Environmental protection?					
Good governance?					

14.

	Excellent	Very good	Good	Poor	Very poor
What is your overall assessment of e-governance services in Ghana?	[ ]	[ ]	[ ]	[ ]	[ ]

List of questions discussed during FGDs

E-governance

- What does e-governance mean to you?
- What e-government services are currently available for the public?
- Which e-government services have you personally used?
- Which do you prefer, electronic or face-to-face transactions? Why?
- What do you think are the benefits of e-governance in Ghana?
- What do you think are the shortcomings of e-governance in Ghana?
- How do you think e-government services can be improved in the future?

Sustainable Development

- How can e-governance contribute to advancing sustainable development?

(Hint: Economic, social, environmental, governance dimensions)

- What are the challenges in implementing e-Government for sustainable development?

International experience

- Do you know of any success stories of e-governance outside Ghana? Why do you think it is a success?
- What lessons can Ghana learn from the successes of other countries?

Appendix G: Top 10 countries for e-government in Africa

Country	Sub-region	OSI	HCI	TII	EGDI	EGDI Level	2018 Rank
Mauritius	Eastern Africa	0.7292	0.7308	0.5435	0.6678	High	66
South Africa	Southern Africa	0.8333	0.7291	0.4231	0.6618	High	68
Tunisia	Northern Africa	0.8056	0.6640	0.4066	0.6254	High	80
Seychelles	Eastern Africa	0.6181	0.7299	0.5008	0.6163	High	83
Ghana	Western Africa	0.6944	0.5669	0.3558	0.5390	High	101
Morocco	Northern Africa	0.6667	0.5278	0.3697	0.5214	High	110
Cabo Verde	Western Africa	0.4861	0.6152	0.3926	0.4980	Medium	112
Egypt	Northern Africa	0.5347	0.6072	0.3222	0.4880	Medium	114
Rwanda	Eastern Africa	0.7222	0.4815	0.1733	0.4590	Medium	120
Namibia	Southern Africa	0.4514	0.5850	0.3299	0.4554	Medium	121